### Papers and Proceedings

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## TWENTY FOURTH REGIONAL SCIENCE CONFERENCE OCTOBER 25-26, 1991

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- Professor P.K. Chaubey, Department of Economics, Devi Ahilya University, Indore.
- 7. Dr. H.C.L. Das, PG Department of Economics, MS College, Motihari, Bihar.
- 8. Dr. S.S. Khanka, Reader, Business Administration Department, Indira Gandhi Open University, New Delhi.
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- 13. Ms. Mala Mukherjee, Institute of Carrier Studies. Lucknow.
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- 22. Dr. S. Thorat, Centre for Regional Development, J.N.U., New Delhi.
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  - 5. Dr. Y.P. Singh
  - 6. Dr. R.S. Tiwari
  - 7. Dr. G.S. Mehta
  - 8. Shri S.D.Rai
  - 9. Dr. Fahimuddin
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# TWENTY FOURTH REGIONAL SCIENCE CONFERENCE GIRI INSTITUTE OF DEVELOPMENT STUDIES, LUCKNOW OCTOBER 25 - 26, 1991

### Rapporteurs' Reports

#### SESSION I

### Regional Disparities and Economic Development With Special Reference to U.P.

Dr. P.N. Pande, Dr. Rajendra Menaria, Shri B.K. Bajpai

The first session of the Twenty Fourth Regional Science Concerence was chaired by Prof. Ashok Mathur. The first paper was presented by Prof. B. Satyanarayan, who discussed the pattern of economic development in India with special reference to interstate disparities. According to him though the main focus of Indian planning has been on economic growth with social justice, the capital—centred and urban oriented approach has not been able to make us self-reliant and nor it could solve the problem of unemployment, poverty and inequality. Prof. Satyanarayan was of the view that inter-state and inter-regional disparity are also a product of our planning process. Discussing the inter-state income disparity and poverty, he said that the problems of poverty and regional imbalance have been created deliberately. He advocated the optimum utilization of natural resources, dispersal

of industries for balanced regional development and establishment of employment oriented industries.

The paper presented by Dr. Sidhartha Shastri examined the industrial imbalances in Rajasthan at regional and sub-regional levels by employing coefficient of imbalance as the tool of analysis. The analysis revealed that inter-district imbalances, have not only been greater than the inter-regional imbalances, they have shown comparatively smaller degree of decline. On the basis of his analysis, Dr. Shastri suggested that regions in Rajasthan are coming closer to one another faster than districts. The problem of regional imbalances must be viewed at the lower areal levels in order to tackle the problem effectively.

Speaking on inter-regional disparities in U.P., Mr. V.S. Singh made his presentation in terms of demographic features, agricultural production and productivity, irrigation, occupational pattern, power, literacy rate, industrial development and other infrastructural facilities. He pointed out that the reasons of backwardnes of certain regions in U.P. and the causes of regional disparities. Mr. Singh was of the view that the government departments and other agencies engaged in development works should substantially enhance the size of development programmes of the sectors in a region which is relatively less developed. He suggested different strategies of economic development for each of the regions in U.P.

Mr. D.K. Bajpai presented his paper on regional disparities in agricultural credit in India, Examining the regional pattern

of loan disbursement by primary agricultural credit societies, his paper revealed that of the total loan advanced in all the states, the share of five states, i.e., Kerala, Maharashtra, Punjab, Tamil Nadu and Gujarat together is about 57.25 per cent. There has been disparity among the states as far as percentage of borrowers to total number of members of PAC with states like Haryana, Karnataka and Orissa having the lowest percentage, while it was highest in Gujarat, Punjab and Kerala. Similarly, there has been disparity among the states as far as per hectare loan disbursement is concerned. Finally he suggested that by way of timely loan repayment by the borrowers the amount of loan disbursement as well as number of borrowers can be increased. The borrowers should be discouraged from taking loans for non-production purposes.

Dr. R.S. Tiwari in his paper made an empirical investigation to analyse and examine the role of different economic and economic factors for the industrial development. The paper examines growth performance, industrial development performance, relationship between observed state of industrial development independent factors and policy measures consistent with industrial development of the state economy. The focus of the discussion was on the state of U.P. in relation to the rest of the economy. The empirical exercise in the paper of Dr. Tiwari that U.P. is poor as compared to India in terms of total NDP and NDP of the tertiary sector. The regression exercise him revealed that industrialisation in the state is mainly the outcome agricultural development, infrastructural facilities urbanisation.

The paper by Dr. Kusum Padalia and Dr. Arun Prabha Chaudhary examined the regional imbalances and Central Government's role as corrective agency. The authors of the paper pointed out that the problem of regional imbalance can not be tackled in simply financial terms as without a planned approach additional finance can not reduce the regional imbalances. Exact equality in services is neither possible nor desirable but a minimum level of facilities should be available to all the citizens. The Finance Commission could play an important role by providing greater assistance to backward states and by building infrastructural facilities.

In the course of discussion Dr.Vikram Chadha emphasised that development of the backward areas should not be considered at the cost of developed regions. Policy should be aimed at the further development of already developed areas so that they may further contribute in the development of the nation. Dr. Rajendra Menariya stressed the use of indicators based on population and foodgrain production in order to measure poverty or regional disparities. He was of the view that extensive welfare programmes can not keep the pace of economic growth.

Prof. Somayajulu pointed out that the need for taking up time series data instead of data based on two points of time to measure the extent of poverty as well as to examine the trend of population below poverty line.

Taking part in the discussion Prof. Choubey said that per capita income is not the only indicator for measuring the poverty line. Prof. Choubey pointed out that without any kind of linkages industrial development is not possible in any particular area.

Prof. A.N. Bose remarked that in addition to assessing the development performance as well as examining the disparities among different regions, we should also consider the intra-regional disparities. Prof. Bose further stressed the need of taking up time series data to have a better comparative picture of disparities among the states. Dr. Fahimuddin emphasised the need of loan recovery for maintaining viability of financial institutions.

Prof. Ashok Mathur, Chairman of the session, said in his concluding remarks that different tools of disparity measurements do not always produce the same results. He pointed out that the main reason for regional disparities has been that the private sector and financial institutions have been channelising the resources to the more developed regions. Prof. Mathur suggested the use of Physical Quality of Life Indicator and Human Resource Development Indicator to measure the level of development along with other indicators.

### SESSION II

### Regional Development Policy With Special Reference to U.P.

Dr. R.S. Tiwari, Dr. S.K. Thorat, Shri D.K. Bajpai

This session was chaired by Prof. Somayajulu. In his introductory remarks, he emphasised the need of village level planning for development. This is so because policy programmes enunciated so far are only on paper, which have not been implemented at the grass root level. This is not only apparent in rural areas but also in urban centres too. In urban areas, development programmes are required to be designed in such a manner that their benefits percolate down to the socially and economically backward classes.

In this session nine papers were presented. The paper by Vikram Chadha emphasised the need for balanced allocation of R & D expenditure. It was pointed out that R & D expenditure in industrially developed states like Maharashtra, Karnataka, Gujarat and Tamil Naou increased, whereas that in less industrially developed states it declined. Also, R & D expenditure has been low for industrial development as compared to other objectives. Further, the utilization of R & D was also found far from satisfactory. This is borne out by the fact that technologies produced by different R & D institutions are 'half baked' and therefore these are unacceptable and unfeasible from the point of view of the requirement of the industries. Thus, balanced allocation of

R & D expenditure is called for for the development of industry, agriculture, health and education, transport and communication and so on.

The paper by Rakesh Kumar and A.K. Singh on 'Determinants of Industrial Development : A District Level Analysis' examined the determinants of industrial development at the district level. Eight factors relating to variables like demand, agriculture, economic infrastructure, social infrastructure and urbanisation have been considered to explain the industrial development of the 55 districts of the state economy in 1980-81 by using the principal component analysis and multiple regression. The study found that growth of large towns influenced the growth of the factory sector. Also, economic infrastructure like, power and transport has a positive impact on the industrial development. However, social infrastructure does not have strong association with industrial development. Agriculture-industry linkage are somewhat significant on supply side but weak on demand side. Factors on supply side were found to exert more influence on industrial development than the factors on demand Therefore, to promote balanced regional development it would be advisable to select towns with population of over 50,000 and above, and provide them infrastructural facilities. These would act as focal points of industrial and overall development of the nearby regions.

Manoj Kumar Agrawal presented his paper 'Analysis of Sectoral Terms of Trade Between Agriculture and Industry in Uttar Pradesh'. The author indicated the two way relationships between agriculture and industry. Some scholars view that terms of trade should remain favourable for agriculture, which may transmit growth waves to the economy. On the contrary others feel that terms of trade should be favourable for the industrial sector, which tend to promote the process of industrialisation in the agrarian economy. Thus nature of terms of trade favouring either of the sectors becomes an empirical question for examination. The terms of trade between agriculture and industry have been examined in terms the index of wholesale price of primary commodity dividing by index of wholesale prices of manufacturing commodities. It was found that terms of trade were unfavourable to the farmers in the and 1970s. The impact of parity index on agricultural production was also examined. It was found that in U.P. terms of trade and agricultural production were inversely related, which led to the industrial expansion.

Mrs. Mala Mukherji presented a note on 'Regional Development Policy'. In this note, various factors responsible for success and failure of regional development policy were discussed. It was pointed out that better entrepreneurial skills could be only developed by having a smooth atmosphere for entrepreneureship. Therefore, direct support to entrepreneurs and innovative firms through up-to-date knowledge, advice, service, technical managerial and financial help is very much needed. Setting up of Udyog Bandhu is a right step in this direction in U.P. The question of policy support to SSI units has also been discussed. It was pointed out that a selective but discriminatory approach needs to be adopted, whereas needy firms should receive help on

the basis of their potential, while policy supports for units interested in trading of incentives must be discontinued.

Prof. P.K. Chaubey presented a paper 'Measurement of Urbanisation: A New Index with an Exercise for Indian States'. Pointing out the inadequacies of traditional urbanisation measure, Prof. Chaube proposed an alternative index of urbanisation which takes into consideration population distribution over urban units along with proportion of population living therein. He used SemTakayama axiomatic framework for constructing the index and delineated its properties. The two measures give different ranking to various states of the country, whereas the traditional measure shows Maharashtra to be most urbanised. According to the new measure, it is Karnataka which is most urbanised.

Dr. Ramanand Singh in his paper argues the need for infrastructural development. It was found that areas which were nearby district headquarters, were more developed than those in far flung areas. Dr. R.P. Singh in his paper 'Rural Development and Micro Level Planning: A Case Study of Jiriban Block, Manipur' suggests that there is wide scope for agricultural, horticulture and forestry development in Jiriban block. The opening of the railway facilities in this region in 1990 has developed tourism, hotels, etc. in this region. Mrs. Nomita Kumar, presented a paper on 'Inter-State Variation in Participation Rate and Educational Status of Female White Collar Workers: A Survey'. The paper attempted to highlight the inter-state variation in female participation rate and educational status of female white collared

workers. It was found that the states of Meghalaya, Manipur, Nagaland, Kerala, Maharashtra and Tamil Nadu were the higher ranking states and the states of Bihar, Orissa, Rajasthan and Uttar Pradesh were the lowest in terms of ranking.

Various comments and suggestions were made in this session on the papers presented. The economic logic of the weightage given to the size of cities was felt for working out the index of urbanisation. It was felt that weightage should be minimum for small while maximum for the large cities. The point was also raised during the discussion that urbanisation is a process, therefore the traditionally used indication of urbanisation should be modified. It was, however, argued that since index of the nonurbanisation takes into account the workers in agricultural sector, the index is therefore useful and need not be Further, the qualification of infrastructural facilities in a more precise manner was needed. It was suggested that from the policy view point. the regional infrastructural disparity should be explained clearly. Also, it was felt that the relationship between the dependent and the independent variables need to be clearly explained and understood. The cause and effect relationship should be clearly understood before jumping to any sort of methodology. In the end, the role of political factors apart from economic factors was also felt important in determining the development at the village level.

#### SESSION III

### Decentralized Planning

Dr. Y.P. Singh, Dr. (Ms.) Ira Bhatnagar, Dr. G.S. Mehta

The Technical Session III focussed on Decentralised Planning was chaired by Prof. A.N. Bose and co-chaired by Shri B.S. Sharma. Presenting his paper on entrepreneurship development in a Notified Backward Economy, Kumaon Region, Dr. S.S. Khanka pointed out that 90 per cent of the entrepreneurs are the local people. He went further to say that though the local people are participating in an active manners for the industrial development, the facilities generated do not appear sufficient to attract the outsiders. He further indicated that there has been a significant occupational shift of the entrepreneurs. A large number of first generation entrepreneurs come from agriculture and business as their background. In terms of industrial development only transport subsidy is separately given to hilly areas; otherwise, the infrastructural incentives remain the same for hilly as well as plain regions. His final suggestion was that a thorough study should be undertaken to locate the exact problems due to which so many projects have either closed down or become sick over time in the area. The second paper was presented by Dr. B.M.Joshi titled Inter-District Disparities and Decentralised Planning in Uttar The inter district disparities have been dealt with 27 indicators. He found that the range of disparities has, increased more in the hilly areas as compared to the plains, particularly in industrial development and social services. About decentralised planning he had to say that it could be made a more effective instrument of balanced regional development by raising the share of the district sector in the divisible pool and, secondly, appropriate changes in the formula of devolution to give larger weight to backwardness.

Presenting her paper on 'Decentralised Planning: A New Experiment in Rajasthan', Ms. Ira Bhatnagar highlighted the new scheme of Mera Gaon Mera Kam launched recently in Rajasthan. The scheme endeavours to actively involve villagers in the decision making and implementation of locally designed development projects. The government will contribute as much as 70 per cent of any project at village level if the local population shares 30 per cent of the cost. This will ensure quality control and also curb the activities of local middle men who cut off a large chunk of funds meant for the upliftment of villagers.

The fourth paper by Dr. Y.P. Singh entitled 'The Village As the Planning Unit in Decentralized Planning' stressed that since inception the micro level plans were largely prepared and controlled by the Centre which have shown a distinct tendency to promote the interests of multi-nationals and big industrialists. The outcome of this is that economic policies have mainly served the interests of the selected few. He, therefore, suggested to include village as a unit of planning.

The fifth paper was presented by Dr. A.K. Singh on 'Allocation of Plan Funds to Districts in U.P.". He suggested that the recent efforts towards decentralisation of planning to

the district level are a move in the right direction, though still falling short of the ideal to be achieved. Thus there is a need to gradually increase transfer of power and resources from the state to district level as the planning capacities at the district level are improved. Further, the pattern of inter-district allocation needs to be scrutinised at the end of each Five Year Plan period and modified as required.

The paper by Ms. Jayashree Shah related to Decentralised Planning: Gujarat Experience. She maintained that though Gujarat has made a stride in initiating and sustaining the efforts for implementing the decentralised planning in the right spirit, all these efforts have not brought about the desirable results. She then suggested the successful decentralised planning to rest upon the efficient working of the Panchayati Raj in the state as well as in the country.

The paper presentation was followed by discussions. Commenting on Dr. B.M. Joshi's paper Dr. H.S. Verma had to say that apart from theoretical approach, practical experiment is required for decentralised planning. Decentralized planning should be based upon local resource endowments, urges, needs and aspirations. As against people's representatives people should be involved in directly the plan execution and monitoring.

Dr. Chaubey emphasized in general whether the issues raised were those of quality or the policy of decentralised planning. He suggested that different units of the polity must care for each other.

Dr. Mishra commenting on Dr. Khanka's paper suggested that the development of entrepreneurs in the hills should correspond to the socio-ecological qualities of the hills. Further, he remarked on Joshi's paper that the quality of hill development in the context of decentralised planning needs a separate framework from the other regions. The decentralised planning at present is actually a bottom unit of top level planning without involving people's participation. Answer to this question depends on the formal grass-root democratic institutions which should be independent of state legislatures or parliament.

Dr. Thorat commenting on the papers expressed that the resources must go to the district taking care of the fact that it is prepared for their developments. Shri Sharma emphasized that we must be clear at the very outset as to how people's participation should occur. Resource raising capacity must be thought of beforehand. Further, he felt that for inter-district comparison initial conditions and time series data must be available. As far as mobilisation of resources is concerned, small savings can go far in this direction.

As the chairperson, Prof. A.N. Bose expressed his opinion that decentralisation is an essential part of planning process. But provision should be made for the direct participation of the people. Thus the purpose and perspectives of the plan must be laid out clearly at the very outset.

### SESSION IV

### **Environment and Development**

Dr. P.K. Chaubey, Dr. Kutty Krishnan, Shri P.S. Garia

The fourth session was chaired by Dr. B.K. Joshi and cochaired by Dr. C.R. Pathak. First paper was presented by Dr.
C.R. Pathak on 'Resource Planning and Management: An Analytical
Approach to Regional Development'. In his paper, Prof. Pathak
emphasized on resource based planning with energy as the centre of
focus. Growth process is stimulated by the inside and outside
forces and they should be considered together in terms of their
relative role in evolving regional development programmes.
According to him, energy is a basic input and it is scarce in
underdevelopment regions. Therefore, economic activities should
be developed according to the resource availability of the region
giving more importance to development of energy in the backward
regions.

Second paper was presented by Dr. Sukhdeo Thorat on 'Irrigation, New Agricultural Technology and Regional Differentiation: Development Experience of a Scarcity Region'. He highlighted the importance of considering quality rather of irrigation as proxied by sources of irrigation. It is the quality than level of irrigation that has a profound influence on adoption of technology cropping pattern, yield, productivity, gross and net income.

Third paper was presented by Tensing C. Rodrigues on Conflicts in Geo-Social Space', in which he tried to find out the

of conflict between geographical space and sociological reasons space. He says that negentropy is the capacity of resources to generate utility at given technology and with the generation of utility, negentropy depletes which implies a reduction in capacity resources to yield utility. Thus the objective of humans has to be extended to include minimisation of negentropy depletion. He developed the concept of 'geo-social space' in which resources and humans co-exist and there is one to one correspondence between human and resources. Dr. Vyas and Dr. Menaria's paper was on 'Choice of Environment and Development'. It emphasized the need for evolving an appropriate technology for the under-developed countries which will be ecologically sustainable. He emphasized the need for a national accounting system which incorporates the external ties particularly depletion of natural resources and other environmental costs.

Presenting the joint paper, Dr. Menaria emphasized the conflict between environment and development and suggested measures, both positive and negative to reconcile the divergent issues.

In the ensuing discussion participants elaborated the various dimensions of the problem of environment and development with focuss on the nature of its influence on the various aspects of human resource development, cropping pattern, distribution pattern, the industry-agricultural linkages and the question of divergence of social and private cost and benefits. The problem of environment as outlined by the discussants needs to be viewed in an international perspective.

### SESSION V

### Agro-Climatic Zonal Planning

Dr. Vikram Chadha, Dr. Fahimuddin

The session on Agro-Climatic Zonal Planning was chaired by Prof. B. Satyanarayan and co-chaired by Prof. P.K. Chaubey. Prof. B.K. Joshi presented his paper on 'Subsistence Syndrome as a Constraint to Agricultural Development in Uttar Khand. Prof. Joshi has tried to identify the subsistence — syndrome as an important constraint to agricultural development. The analysis carried in the paper leads to the conclusion that subsistence — syndrome is so deep rooted that it is difficult for the economy of Uttarkhand to come out of it. The author was of the view that a shift of workforce from agriculture to other sectors appears unlikely in the present prevailing situation. Therefore, a relevant development strategy for the region will have to be land based in view of the fact that majority of the people are dependent on agriculture.

In his paper 'Regional Disparities in Agricultural and Industrial Development in India' Dr. H.L. Das examined the regional disparities by measuring the levels of agricultural and industrial development in the major states in India and suggested measures to reduce the regional disparities.

B.K. Bajpai's paper was on the 'Pattern of Development and Change in Indian Agriculture : An Inter-State Analysis'. It was based upon an a priory hypothesis that the regional disparities of agricultural development in India were created during colonial period. The paper deals with the three basic themes of Indian agriculture. The first part presents the pattern of technological changes in Indian agriculture which has taken place after independence. Second part takes into account the agricultural development of post-Independence period till the time of Green Revolution and the third part deals with agricultural development policy and strategy after Green Revolution. At the end author concluded that the Green Revolution is confined to a very limited zone of canal irrigated area, which was the top productive tract of the country.

Dr. G.S. Mehta read a paper on 'Role of Horticulture vis-avis Agriculture in the Development of Western Himalaya Agro-Climatic Region'. The paper pertained to the potentials and feasibilities of horticultural development in Himachal Pradesh and U.P. hills. It also examined the variations in productivity levels, returns, and employment absorption capacities between agriculture and horticulture sectores. The state of Himachal Pradesh and Uttarakhand of U.P. have been considered as the western Himalayan Agro-Climatic Region. It is based upon a sample survey of 501 fruit growers of the region. The author first characterised the potentials of horticultural development in the sample area and then he concentrated on apple plantations. Productivity levels costs and returns of agriculture in general and of apple trees in particular have been discussed by age group of trees as well as according to the size of orchards for both

H.P. and U.P. hills. At the end level of employment absorptions is elaborated. It is concluded that this agro-climatic region due to its peculiar geographical condition is more suitable to horticulture than to field crops which are uneconomic in comparison to growing apples. It is also concluded by the study that the labour absorbing capacity of apple cultivation is also more than the field crops. However, marketing horticultural crops in the region is a major problem thereby restricting the area expansion of apple cultivation.

Dr. Fahimuddin in his paper on 'Constraints on Agricultural Productivity in U.P. Hills' found that agriculture in U.P. hills (after the exclusion of Nainital and Dehradun districts) is underdeveloped and backward as compared to other regions and the state. Though cropping intensity is still highest but value of agricultural produce per capita and per hectare of net sown area is lowest. This means that there is a need to increase the productivity of the crops by suitable technological package in U.P. Hills.

Dr. A. Joshi in his on 'Regional Development Through Agro-Processing Industry: A Case Study of Khandsari Industry in U.P.' stressed the need to develop the khandsari units in the Central and Eastern regions of the state which have substantial potential of growth for this industry after the Western region. The government should reconsider its policy of not granting licences to new khandsari units by helping them to adopt new technology in the form of mini-boiler plants. So that the main problem of khandsari units, i.e., recovery of sugar could be partially taken care of.

The paper presented by Dr. P.N. Pande examined the economies of mango cultivation in terms of production level, productivity, cost, structure, return, marketing and income and employment in different mango growing agro-climatic zones in India. The paper was based upon a sample survey of 901 mango growers spread over in Western-Plateau-Hills region, Gujarat Plateau-Hills region, Middle Gangetic-Plains region and Southern-Plateau-Hills region. The author analysed the production level of mango crops in different agro-climatic zones among the sample households. Productivity, cost structure and net return from mango cultivation was also analysed. The survey data revealed that mango cultivation was the major source of household income which contributed 66.73 per cent of the total household annual income.

Though the per acre mange production was found highest in Southern-Plateau-Hills region but due to inferior varieties of mangees the crop could not fetch the higher prices. As a result per acre net return was recorded lowest in the Southern Plateau-Hills region. Per acre net return from mange erchards was recorded highest Rs.7296 in Western Plateau-Hills region and lowest Rs.4540 in Southern Plateau-Hills region. Lastly the paper gaves estimates of employment level in the different agro-climatic zones in mange cultivation. The marketing aspects of mange fruits in different agro-climatic zones were also discussed by Dr. fande.

Dr. Shiv Fratap Singh in his paper discussed how to conserve diesel, electric power and underground water resource in the rural areas and what should be appropriate techniques to tackle it.

Participating in the discussion Prof. C.R. Pathak expressed the view that land based strategy for the development Uttarkhand region would be not adequate as Prof. Joshi has suggested in his paper. Prof. A.N. Bose was of the view that hill forests, should be allotted to the village people from the view point of income and employment generation. In this way peoples" dependence on agriculture can also be reduced. Mrs. Mala Mukherjee was of the view that male members of hill areas should be provided gainful employment. Prof. A.K. Singh expressed the view that subsistence syndrome in hill region was due to the predominance of marginal holdings. Public distribution system needs to be strengthened in order to encourage farmers of this region to adopt cropping pattern shift from foodcrops vegetables and horticulture. Prof. Singh also expressed doubt about the growth rates of paddy given by Dr. Fahimuddin in his paper. Mr. Manoj Agarwal of Lucknow University expressed doubt about Gujarat state being ranked as agriculturally developed state in Dr. Das's paper. He said that U.P. was agriculturaly better developed than Gujarat. Dr. R.S. Tiwari was of the view that Gujarat was more agriculturally developed than U.P. because of higher level of mechanisation. Dr. Sharma intervening in the discussion said that cereals production is better in U.P. than in Gujarat while the reverse is the case of bilseeds production. Moreover, the success of Gujarat on the agricultural front also be attributed to very great extent to the co-operatives of Dr. Chaubey said that Dr. B.K. Joshi's paper is well formulated and can help in solving some problems of Uttarkhand

region. Dr. Kutty Krishnan said remittances had a partial effect on Kerala economy. Lastly Prof. Joshi responded to the questions raised on his paper. He clarified that he has not suggested the land based strategy as the only strategy to be adopted for the development of Uttarkhand region. He supported Prof. Bose's suggestion of giving forest and its management under forest panchayats. He was also of the view that horticulture can not be developed in U.P. hills as it has been done in Himachal Pradesh because of various constraints.

# IN SEARCH OF AN ALTERNATIVE DIRECTION OF DEVELOPMENT (A synopsis for initiating discussion)

A.N. Bose\*

### (I) Present Condition

General direction of development since 1947 has landed our country in 1991 into a situation where,

- (i) We are on the brink of losing our political independence achieved 44 years back. We seem to have completely lost our self-reliance. We are unable to pay the annual instalment for repaying our foreign debt without getting at least equal amount of additional foreign loan. For our industrial development we have completely opened up our economy to multinational capital and their junior Indian partners, the Indian monopoly capital.
- (ii) We are increasingly adopting a technology of production, both in agriculture and industry, which is causing irreversible damage to eco-balance. Thus, like irresponsible parents we are sustaining ourselves today at the arave cost of our future generations.
- (iii) The number of hungry people below the poverty line now is far above the total population of the country at the time of independence. (This is particularly true also for such states like West Bengal).
- (iv) Increasing bureaucratisation and criminalisation of politics are making it more and more impossible for the

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people to play any part either in current decision making process or in defining any alternative to the present impasse. Even in states like W.B., which is supposed to be having one of the best panchayatiraj institutions in our country, it is characterised by an impossibility of the direct participation of the village people in running even the lowest tier of the panchayatiraj systems. This is so because (a) even this lowest tier, despite its misleading name 'gram' panchayat, is based not on one village but on a cluster of 10 average villages with a population of around 13,000, where people participate only indirectly through their few elected representatives, (b) in most cases even these elected representatives are controlled by the few self\_elected people organised in a local branch of this or that party controlled hierarchically by the state or central level political leadership, and most important, (c) the panchayats have degenerated into simply a part of the Govt. machinery to make the people more and more dependent on the state finance making the former forget the crucial need for self-reliance, for critically examining on the basis of their concrete experience the projects and programmes formulated by the Government, for suggesting any alternative for either shortrun projects or longrun programmes and policies. In short, panchayats have became an integral part of the long arm of the Government trying to domesticate particularly the oppressed and the poor within the present socio-economic structure. More efficient it is in distributing Govt. subsidy, higher is the extent of domestication of the

### (II) The Main Roots of The Present Impasse

During the struggle for independence it was clear that political independence coule be consummated only if it could be complimented by basic economic reform centred on land reform and social reform centred on abolition of caste and gendre privileges as well as of illiteracy.

Mainly due to the lack of conscious, self-reliant organisation of the oppressed and the poor people themselves coupled with the way we got our independence have so far made it impossible to compliment the political independence with socio-economic structural eform. As a result, the 'forces' or 'interest groups' who could strike a deal without the then foreign rulers had established themselves as the dominant political forces in our country. They are, in the main, the big property owners having their central economic interest in maximising their profit and rent income requiring maximum possible subjugation of the interest of wage labour, of tenant farmer, i.e., of poor producers of wealth.

In such a 'property' based economic systems, its efficiency and sustenance depended upon the rate of surplus that this property could generate for its owners. That is why the central and the state Governments, controlled by the forces allied to the property owner, endevoured to develop basic industry in the initial phases to provide

the property owners, as yet unable or unwilling to invest huge capital and wait during the gestation period for developing these basic industries themselves, with the required economic infrastructure. Under such circumstances, development of science and technology could be meaningful prilarily when it could help the property owners to increase their rate of surplus.

Such a 'property' or 'capital' based economic system, particularly in country kept backward by their colonial rulers and their allies, has to get tied to:

- (i) foreign capital in search of advanced technology to sustain and increase its surplus in a competitive market and to become in that process a junior partner of foreign capital,
- (ii) decreasing labour intensity in production because what we call modern technology has been developed in the labour deficit West primarily to economise on labour, and also because the expenditure on labour or 'wage' is a cost item to the property owners and hence reduction of wage cost is an important tool for increasing surplus for the property owners, and
- (iii) production mainly for the top 10/15 percentage of the population having capacity to pure ase industrial goods, and becoming irrelevant, if not harmful, to the majority of the people mostly below the poverty line who either

cannot purchase their goods, or can purchase these only by further reduction of food intake,

- (iv) rapid destruction of tiny and small units relying on local technology and hence incapable for competing with industries dominated by foreign capital and local monopoly dapital and their foreign technology, and
- (v) becoming a haven for the Polluting industries both for reducing cost of instaling anti-pollution measures as well as for saving the 'advanced' capitalist countries from pollution.

### (III) An Alternative Direction

Basic alternative to private profit maximising property or capital based production system is human satisfaction maximising labour based production system.

Goods for which market demand exists and production of which is likely to fetch at least the minimum expected profit are produced is the current capital based production system. The facts such that a very large section of people today can not transform their need even for minimum required foodgrain into an effective demand for the same, or that a large part of the goods produced may have market demand but have not only noralevance to most of the people but also may be polluting the environ and increasing the import burden of the country etc. have no direct relevance to this private profit maximising capital base production system.

In the alternative labour based system, the prime concerns are to first satisfy the needs of the labouring people and their families, and to see to it that the fullest possible utilisation in guranteed of all the available labouralong with all the local resources of the nation.

In the context of this latter system, by far the two greatest defects of our current capital based system are:

- (i) existence of huge number of people below the poverty line despite the fact that the average consumption in the country is much above the poverty line, and at least equally important,
- (ii) existence of a huge idle labour time which the present society is now wasting, and utilisation of which would have led to substantive increase in production in a self-reliant and eco-sustaining fashion.

labour alone, it is estimated that with around 17 crore agricultural workers in our country now each having at least 100 days of effective unemployment per year, our present Indiansociety is wasting annually at least 1700 crore person—days of labour. Money value of this labour at the rate of even Rs.22 per day, the rate at which manual labour is paid in Government employment schemes, is at least Rs.37,400 crore per year or more than the total annual plan investment by the centre and the states during our seventh plan.

This labour cannot be used by the present capital based system because (a) additional employment is not considered profitable by the capital, i.e. marginal productivity of the additional labour is below wage plus expected surplus, and hence additional capital investment on additional labour is likely to fetch less than expected surplus, and (b) Government do not have the financial capacity - even if it has desirable motivation - to invest for using as wage labour even 10-20 per cent of this idle labour. At present it can not use even 5 per cent of this idle labour time.

Had there been no socio-economic constraint in utilising this idle agricultural labour time, had the fulfilment of the need of the people along with sustaining political independence and eco-balance been the main motive for productive activity, this labour in every village could have been utilised to level the land, to construct contrur bunds, to excavate and re-excavate irrigation and drainage channels and ponds, to dig compost pits and pit latrines, to cultivate blue-green algae and other green manures, to repair and construct residential huts and school and club buildings, to epair and construct local roads, etc. It is estimated that such a fullutilisation of agricultural labour can lead to an increade in agricultural productivity by at least 100 per cent in 10 years.

The main pre-condition for utilising this huge idle labour is the ownership of land by the labour who are actually tilling the land. Investment of their labour on their own land then can no longer be constrained either by the criterion of adequate profitability of capital or by the financial capacity of the Government labour can go on investing their own currently idle labour on their own land till the marginal labour productivity is slightly above zero.

This will result in (i) nearly instant-neous elemination of the core of the poverty problem, (ii) self-reliance, and (iii) sustaining eco-balance particularly if the production system in the manufacturing industry is similarly changed.

With the labouring people becoming the owners of the means of production, replacing thereby the rule of capital by the rule of labour, the lattern will be able to transform their minimum needs into effective demand, and there will not be any concentration of income and demand with the top 10 per cent of the population and hence the whole of the labour based production system will be oriented towards fulfilling the needs of the working people.

### IV. HOW TO MOVE TOWARDS THIS ALTERNATIVE

The primary pre-condition for a move towards this alternative of a labour based production system is a firm conviction of the labouring population that such a system is objectively possible inducing them to organise themselves to try to remove the constraints to achieving this desirable socio-economic alternative structure.

These constraints include the existence of the current power structure where a tiny minority has been able to usurp all power - social, economics and political - and to use this power for furthering the very short run interest of the upper class, upper caste, males, ignoring, among other things, the resulting loss of political independence and serious disorder in eco-system which will be substantially harming even their own children.

Dislodging these narrowly selfish, short sighted few but as yet very powerful clique is necessary not only in the interests of the poor working people but also in the interest of the nation as a whole including the children of the present rulers.

One of the principla ways to enable the people to develop further the required conscionsness is to make them look at and analyse their respective villages and factories to find out (i) how much could have been produced and distributed from their own area had there been

no socio-economic constraints in fully using their labour to use the land the already existing machines and tools, and other local resources. This may constitute their village (or factory) level 'perspective planning target', (ii) the difference or the contrast between the above, i.e. 'what is possible', and the present reality. How much less is the current production ? How the fruits of the current production (or income or value added) distributed among the various classes and castes of the local people ? what is the difference between the level of income 'possible' for the poor and their current level of income ? What are the eco-degrading aspects of the current production technology and how these can be replaced by eco-sustaining ones in the perspective plan. Even the poor working people kept illiterate by the present society can easily understand . their own working area, may be with some marginal initial help, and become acutely, conscious of the huge gap between 'what is possible and 'what now exists', making them concretely conscious about the huge cost the people are paying now to sustain the current stupid socio-economic-cumpolitical structure, (iii) the impact of existing Government measures by the occupation-class-caste-gendre of the beneficiaries concerned in the context of the above 'possibility'. This context is crucial both to realise the gap between the amount of relief available to the poor through existing Government schemes and what is possible

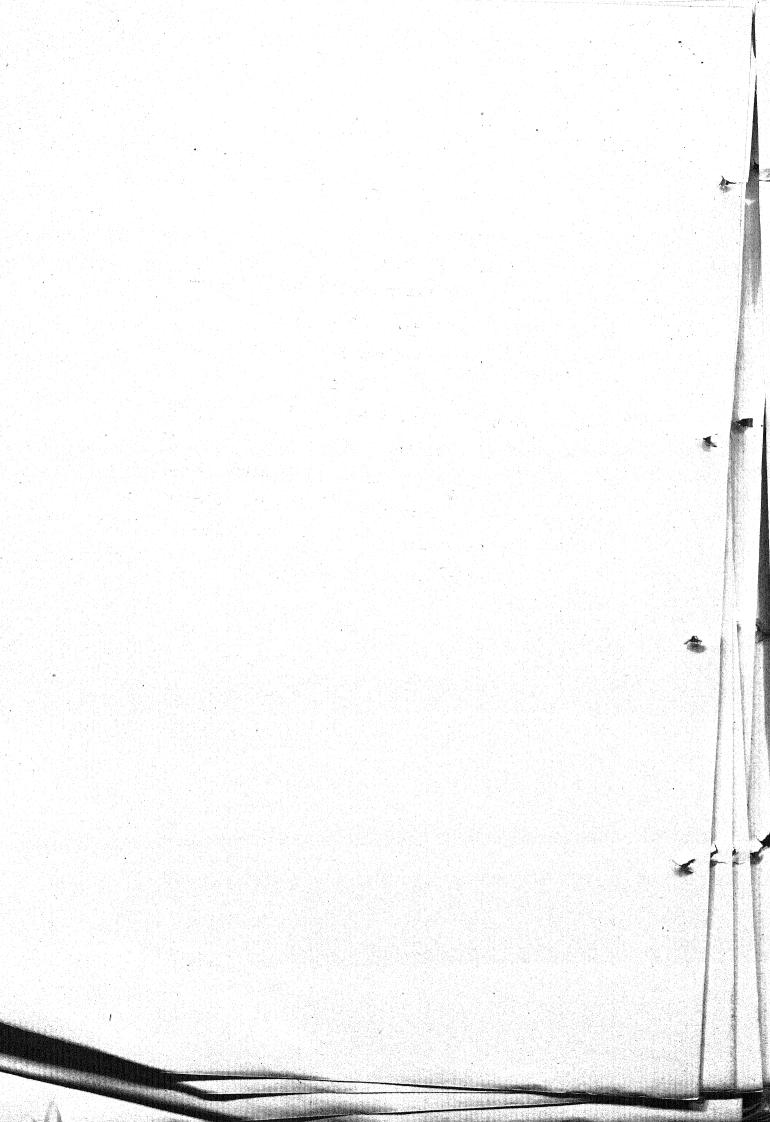
in the alternative, and also to become conscious whether the existing relief measures are rendered in a way such that it becomes a conscious step to move forward towards realising what is possible, or the relief is used in practice to keep them belinded as to what is possible so that they may start considering the present condition as the most desirable one. This understanding about the quantity as well as the quality of current Government relief in the context of what is possible in the specific area known to the people concerned is crucial for their realisation as to the nature of the present socio-economic\_cum-political structure and how to move forward towards the alternative. It took our country 171 years from 1747 to 1928 to become conscious about the need for independence, the basic alternative in the then situation. So, we may not dispair at our inability to define the required alternative now during the last 43 years, 1947 to 1990

It is in the background that there should be a concerted demand for:

(i) Maximum possible decentralisation of planning, plan implementation and administration taking village (or ward or factory in urban areas) as the lowest unit because this is the biggest unit where all the adult people can regularly sit together to run their own affair.

- (ii) Division of all power and the corresponding financial resources between the centre, the states, the districts, the blocks, and the villages following the principle that whatever can be decided at the lower level will not be kept for decision making at the higher level,
- (iiii) All the democratic, pro-working people, socialist individuals, groups and parties may instead of dividing the poor to mobilise them behind the various parties so that they may eventually rule the country in the name of the people try to conscientise the poor, the oppressed, and the women in each village or urban ward or factory etc. so that they as conscious groups constituting in most cases the majority in the respective areas exercise their hegemony democratically in the process of both decision making and is its implementation in the village or factory level. Only this can guarantee changing the direction, from the capital based to a labour based society capable of practising socialism in a truly democratic a fashion relying directly on the people.
- (iv) In the interim period till it becomes possible for the people to overcome the constraints to effect a basic change in the direction of development towards a 'labour based society', there should be a concerted

move to allocate at least 25 per cent of the plan fund formally earmarked for the rural people directly to the village ensuring simultaneously that villagers can redress the various schemes taking into account both the perspective as well as the specific features of their village reality now to enable them to manage development far better, both quantitatively as well as qualitatively, that the current administrative and political bureaucrats. This is essential to demonstrate that hegemony of the working people is the best guarantee for providing best possible service to the whole society. Such a demonstration in all possible fields may constitute the most decisive element in laying the foundation for a firm move towards the alternative direction for having a labour based society.



ECONOMIC DEVELOPMENT IN INDIA - WITH REFERENCE TO INTER-STATE DISPARITIES

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B. Satyanarayan



## $\frac{\texttt{ECONOMIC}}{\texttt{INTER-STATE}} \, \frac{\texttt{DEVELOPMENT}}{\texttt{INDIA}} \, \frac{\texttt{INDIA}}{\texttt{DISPARITIES}} \, \frac{\texttt{WITH}}{\texttt{REFERENCE}} \, \frac{\texttt{TO}}{\texttt{TO}}$

B. Satyanarayan\*

I

A developing country like ours is still faced with quite a large section of population, which is not only illiterate and below poverty line, but also either unemployed, under-employed or non-employed. The main focus of Indian Planning has been on growth and social justice. The mid-term appraisal of the Seventh Five Year Plan and the need to explore proper economic strategies for the ensuring Eighth Five Year Plan, has raised the question of recasting development strategies in right earnest. The capital-centred and urban-oriented approach has not been able to make India self-reliant or achieve removal of poverty or less in unemployment and inequalities between various regions including the distribution of income to any significant measure. All these are the important objecties of Indian Planning.

The main reason as to why a large chunk of this country's population is still suffering from a sub-standard or subsubsistence medium of living is that no systematic thought has

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been given to provide the basic consumer's essentials to the target groups. It was expected that special employment income generation measures would serve the purpose. Poverty was never considered as primarily remedial through systematic reduction of unemployment and underemployment. Hence, scarce resource which could have been utilised for creating assets, which in turn could have secured, a continuing flow of employment and reduction of poverty as well as reduction of disparities between various regions in a systematic manner, have had to be diverted for the creation of adhoc opportunities of employment or poverty relief measures or welfare programmes. As a matter of fact, the major flaw in Indian Planning is that relevant production spectrum has never been designed on a long-term basis to achieve consumer's equalitarianism through choice of appropriate techniques, incomes and wage policies, employment and manpower planning.

#### Objective of Development:

The objective of long-term development is normally taken as the attainment of golden-age. This is a stage wherein all the working population then existing will have been given employment with a technique which gives steady growth at the highest standard of living technically feasible and rising according to the full utilisation of scientific advances. In the long-run, for the economy to be able to give this choice, the capital stock of the country has to be very high, specially in the basic industries which provide equipment for

themselves, for the never forms of technology and for whatever type of consumer goods which the society may then want.

One may as well pose a question as to why we should worry about building up the capital stock of basic industries when the general standard of living is below what would be considered as a reasonable subsistence level if they are employed. It is presumed that the interest of the present generation as well as the future un-born generations is equally taken into consideration while planning for the country's development. It is only on this basis nations and economies are built up. If the commitment to rapid development were to be shown a hundred years back by the then existing Government, we would have been by this time, economically one of the front-ranking countries.

#### Choice of Development Strategy:

From among the various available Strategies of Development, two seem to be important from our point of view. The first strategy uses the technique which most of the advanced countries used for the production of necessaries like foodgrains, cotton cloth etc. They are highly mechanised techniques and make use of the products of the Heavy Industries Sector. The product per man employed is high in these techniques but capital is more than proportionately higher than in the less-mechanised techniques. On the whole, such techniques exhibit high profit to wage ratio when general wages are at subsistence level, and also create a distribution

pattern of income which becomes unfavourable to social justice. Incidentally, under this system very little employment is created per unit of capital in the aggregate.

The second strategy is based upon the use of the lessmechanised techniques for the consumption-goods sector. rationale of this strategy is that for the attainment of the desired objective of the maximum accumulation of the Heavy-Investments' equipment, the rate of growth of the consumption good sector should be kept as high as is compatible with technology and the needs of inputs of consumer necessaries. The benefit of choosing this strategy is that the techniques used in this Model conserve the resource of the Industries sector and hence do not draw away the resources this sector to any sizeable extent. Hence, the leakage out the Heavy-Industries Sector being low, the plough back rate its products within itself would be very high. The Heavy-Industries Sector may use the most advanced and sophisticated techniques alongside the less-mechanised methods. Thus, it is a combination of techniques of different degrees of mechanisation in the Heavy-Industries Sector along with techniques conserving the use of products of the Heavy-Industries Sector in the consumption sector which given the overall effect to this strategy as one generating growth with social justice.

#### Balanced Allocations:

In a planned economy, the government has to divide the total expenditure into two types - The first one, are the inflaltion - creation investments, and the second one, are the inflation-dampening investments.

The Inflation-Creating expenditure include long-gestation investments, and expenditures of a prestigious nature, including most of the defence expenditure. Consequent upon the investment and the incomes that flow, demand for consumption goods is created, but for supply one has to wait for a long time (or forever, when it is the case of wasteful expenditures or defence expenditures which do not ever bring feedbacks of material product for the civilian industrial production).

The Inflation-Dampening Investments are in necessaries of consumption, or the equipment for their production. These are mostly quick-yielding investments in agriculture or agroindustries or minor irrigation, miniature scale industries, etc. Through these, the supply of necessary consumption goods increases in the market, to cater for the increase of demand created by the total investment in the country.

To achieve stability in the price level, one has to maintain a ratio whereby the Inflation accelerated by one type of investment is restrained by the other. This is so irrespective of how financial resources are raised. Thus, if financial resources are raised through taxation and spent upon

increasing the salaries of the government servants or expenses beyond that envisaged by the law, or upon beautifying the towns or in costructing the administrative buildings of Universities and banks, it will be a pro-inflationary situation. If financial resources are raised through deficit financing and spent upon defence it is bound to be proinflationalry. But if they are spent upon increasing production of foodgrains and cotton, then deficit-financing anti-inflationary, the ratio in which the two types of investments are mixed is crucial. There will be one ratio of the quick-yielding productive investments to the long-gestation expenditures which secures non-inflationary growth, this is termed as Balanced Allocation Ratio.

## The Appropriate Techniques:

Indian Planning was broadly based upon Mahalanobis Model starting from the Second Plan onwards. In his two-sector model, Professor Mlahalanobis took the structure of production of advanced countries based upon a general shortage of labour, and planted it in a country where we have surplus labour. This led to the adoption of techniques of high degree of mechanisation and high capital-output ratio not only in the capital goods sector but also in the consumption goods sector. Under these circumstances, the system of Balanced Allocation Ratio can hardly work.

The techniques of a low degree of mechanisation in the consumption sector are not only important from the point of view of controlling inflationary pressures through rapid supply of commodities, but they also do not make use of foreign exchange as well as the products of the Heavy-Investment sector. Furthermore, the techniques of low capital-intensity are more employment-creating per unit of capital investment than the highly mechanised techniques. They also have a high share of wages in income. The equipment of these techniques can be manufactured in villages and in small towns, and they can, therefore, generate the growth in the rural areas and economically backward regions of the country.

II

Having discussed various issues relating to the overall economic development of a country like India, we shall now try to have a look at the inter-state/region development which has already taken place. One can make a broad comparison of the population below the poverty line along with the inadequacy in calorie intake in various States. This will give us the existing position of various States. Table I will show these details.

Table 1 : <u>Distribution of Households According to Dieting</u>

Inadequacy

S1.No.	State	% of HHs with Inadequate in Calories and Proteins	Diets
1:	Punjab		NA
2.	Kerala	사람이 되는 사람 이 등 사람이 되었다. 19 전 10 전 10 전 10 전 12 전 12 전 12	53%
3,	Maharashtra		N A
4.	Andhra Prade	esh	38%
5.	Orissa		42%
6.	West Bengal		29%
7.	Karnataka		13%
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Source: "EPW", Dated 17-12-1983, p.2164.

Data from country-wide diet surveys carried out by the National Nutrition Monitoring Bureau (NNMB) shows that diets in more than half of the households surveyed in Kerala are inadequate, while the precentage of these households is in the range of 40% in Andhra Pradesh and Orissa. The position of Karnataka looks for better in the sense, that only13% of the surveyed households are suffering from inadequate diets. Table 2 shows the population below the poverty line in various States in India.

Table 2: Population Below Poverty Line (1977-78 & 1983-84)

			Per cent)
S1. No.	State	1977-78	1983-84
1.	Bihar	57.5	49.5
2.	Madhya Pradesh	57.5	46.2
3.	Uttar Pradesh	50.1	45.3
4.	Orissa	66.4	42.8
5.	Tamil Nadu	52.1	39.6
6.	West Bengal	52.5	39.2
7.	Andhra Pradesh	42.2	36.4
8.	Karnataka	48.3	35.0
9.	Maharashtra	47.7	34.9
10.	Rajasthan	33.8	34.3
11.	Kerala	47.0	26.8
12.	Gujarat	39.0	24.3
13.	Assam	51.1	23.5
14,	Haryana	24.8	15.6
15.	Punjab	15.1	13.8

Source: "CMIE", September, 1988, Vol.2.

Notes: 1) For 1977-78, the above estimates are derived by using All India Poverty Line ofRs.65 per capita per month in 1977-78 prices corresponding to minimum daily calorie requirement of 2400 per person in rural areas and the poverty line of Rs.75 per month corresponding to daily calorie requirement of 2100 urban areas.

2) For 1983-84, the above estimates are derived by using the poverty line of Rs, 49 per month at 1973-74 prices corresponding to daily requirement of 2400 per person in rural calorie areas and the poverty line of Rs.57 per capita per month corresponding to calorie requirement of 2100

urban areas.

As far as poverty is concerned, in 1983-84, the proportion of the poor was the highest in Bihar (49.5%) and the lowest in Punjab (13.8%). May be, this is due to the higher level of per capita land and percentage of irrigation in Punjab. Inversely, Bihar has the lowest per capita income while Punjab has the highest.

So far as Kerala is concerned, the poverty ratio has declined from 47% in 1977-78 to 26.8% in 1983-84. People attribute this steep fall to three reasons (i) Due to remittances from migrants to the Middle East Countries; (ii) Due to the extensive Welfare Programmes; and (iii) Due to a relatively lower population growlth. Likewise, Assam seems to have recorded a noticeable fall in the proportion of population below poverty line.

On the other hand, Punjab which has the lowest poverty ratio is not particularly know for such welfare programmes as in Kerala and some other States. But Punjab has consciously or unconsciously set to provide a firm production base which has helped to maintain the lowest poverty ratio. If this is so, it holds a lesson to others.

Given the socio-economic structure, the decline in the poverty ratio is generally the result of growth achieved, especially in agriculture and the effective implementation of various poverty alleviation programmes like NREP, IRDP, RLEGP, JRY, etc. These anti-poverty programmes have to be area and community specific. in order that their benefits may be

widespread. They have to offset the uneven effects of economic programmes on the poorer sections in different areas. Generally, the tendency is to select the easily accessible areas and politically dominant groups. The numerical targets may thus be attained but the basic purpose of the programme will not be served. Planning at the block district and region within the State level has been devised to counteract this tendency.

It is very often expected that the fruits of 'development' will percolate to the weakest sections of the society. It is a fact that in India the poverty ratio has no direct relationship with the existing per capita income level. While per capita income is rising, poerty ratio is more or less constant. It is time that the overall economic, agricultural, and technological development is a condition necessary but not sufficient to eradicate poverty and undernutrition. There is reason to believe that the very momentum of the developmental process has served to accentuate socioeconomic disparities. Therefore, the challenge of development, for countries, like India, which have chosen the democratic poliitical system, likes in devising ways and means of ensuring equitable distribution of the benefits of economic growth only among various sections of population but also in various States and regions across the country. This becomes clear when we look at the per capita State incomes of variousStates. Table 3 records these figures.

Table 3: Per Capita State Income of Various States (1985-86)

S1. No.	State	At Current Price(Rs.)	Annual Rate of increase between 1970-71 and 1985-86	prices	
<u>Majo</u>	or <u>States</u>				
1.	Punjab	4479	10.0%	1656	3.0%
2.	Haryana	3743	10.2%	1229	2.3%
3.	Maharashtra	3430	10.4%	1029	1.8%
4.	Gujarat	2775	8.4%	832	
5.	West Bengal	2744	9.3%	839	1.0%
6.	Tamil Nadu	2353	9.8%	779	2.0%
7.	Karnataka	2264	8.8%	756	1.1%
8.	Andhra Pradesh	2184	9.2%	743	1.6%
9.	Kerala	2140	8.9%	646	0.6%
10.	Assam	2068	9.4%	604.	0.8%
11.	Rajasthan .	2043	7.9%	663	0.1%
12.	Uttar Pradesh	1960	9.8%	615	1.6%
13.	Orissa	1954	9.8%	551	1.0%
14.	Bihar	1548	9.4%	488 .	
-	All India	2596	9.9%	798	1.6%

Source: "Centre for Monitoring Indian Economy", (CMIE), Bombay September 1988, "Basic Statistics Relating to the Indian Economy", Vol2 (States).

may be observed that Five States, namely; Punjab, Haryana, Maharashtra, Gujarat and West Bengal are having the per capita State Income higher than the All India Average, which was at Rs.2596 in current prices and Rs.798 in 1970-71 prices during the year 1985-86. It may be also noted that a State like Punjab was found to be enjoying nearly double the All India Average Per Capita State Income. The Average itsélf hides the real truth, in the sense, that except (5) above mentioned States, all the other States in India are having per capita State Income which is very much baelow the All India Aerage figure. One can see that Punjab is having nearly (3) times higher per capita State Income when compared to States like Bihar and also Orissa to some extent. These differences look slightly more pronounced in terms of real (1970-71) terms. The annual rate of increase in the per capita State Income for States like Punjab and Haryana are relatively very high compared to all other States. It means, the gulf between various states (between relatively Developed and other underdeveloped States) is gradually increasing through time. trends could be observed from Annexure 1, 2 and 3, which throw light on regional imbalance in various States from 1970 to 1985.

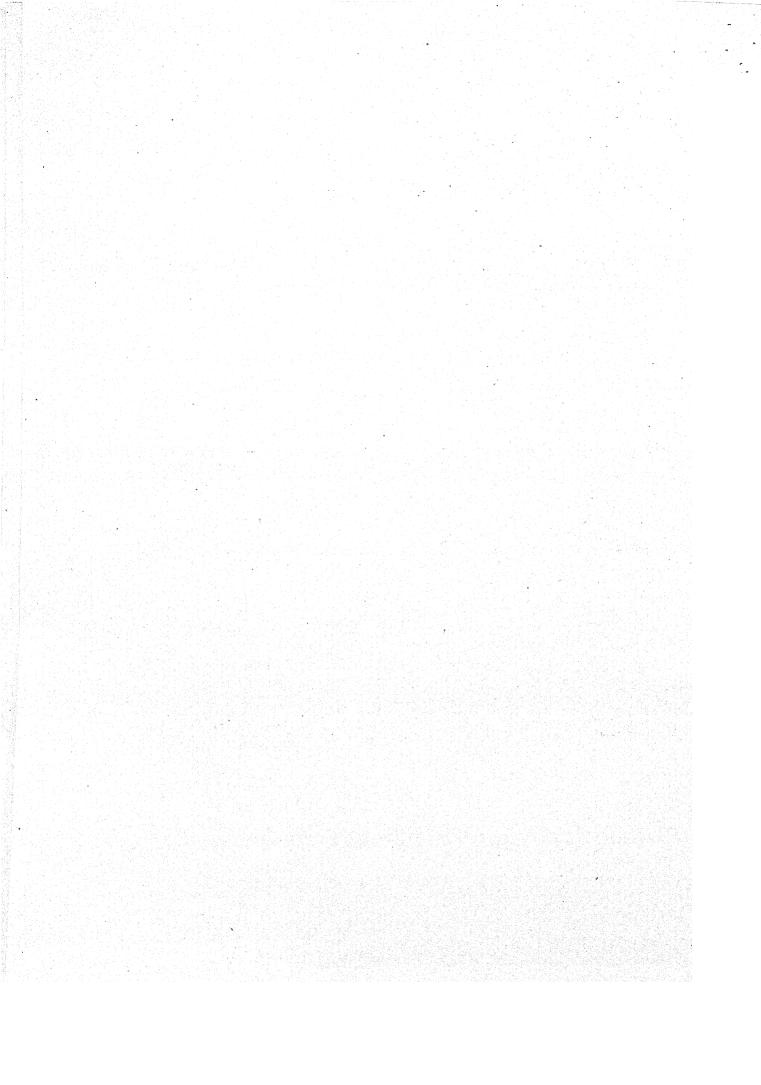
If the place of development in most of the States which are below the All India Average Per Capita State Income is not accelerated, there is very possibility of their sliding down still further. This process could be combated to a very

greater extent by means of effective in dustrialisation. Some broad policy issues are:

- (1) Optimum utilisation of natural resources with emphasis on conversion of raw-materials into value-added products within the State:
- (2) Dispersal of industries to get balanced regional developments;
- (3) Encouraging employment-oriented industries.

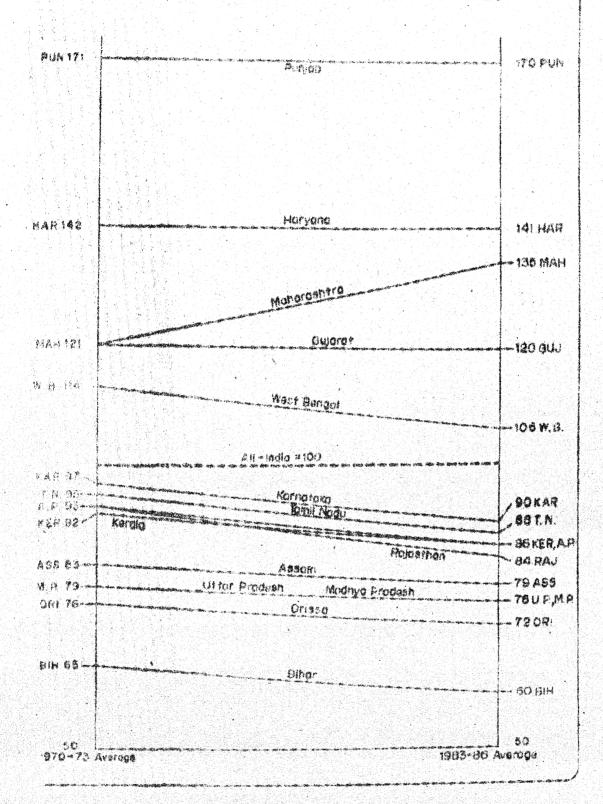
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# Regional Imbalance

As Measured by Index (All-India=100) of Per Capita Stata Income at Current Prices 1970-36





#### Determinants of Industrial Development - A District Level Analysis

Rekeen Kimer and A.K. Singh\*

#### I. Introduction

trialisation of backward regions have been among the major objectives of development policy in India since the begining of the planning era. Over the years the district has emerged as an important unit of decentralized planning. A large number of districts have been declared as industrially backward and special incentives are offered for their faster industrial development. In this context the study of the determinants of industrial development becomes highly relevant so that the key factors affecting industrial development at the district level are identified and policy measures based on them are envolved. The present paper is an attempt in this direction.

<sup>\*</sup> The authors are Lecturer in Economics, Lucknow University, Lucknow and Professor in Economics, Giri Institute of Development Studies, Lucknow respectively. The paper is an abridged and revised version of Chapter-VII of the Fh.D. thesis of the first author submitted to Lucknow University under the supervision of the second author/entitled Regional Imbalances in Industrial Development in U.P., 1987-88 - A Study of The Factory Sector, Lucknow University, Lucknow, 1987 (Unpublished).

The paper is based upon a cross-section study of 55 districts of Utter Predesh for the year 1980-81 and is confined to the factory sector alone. At first, composite index of factory sector industrial development is worked out for each district considered and their veriation in the level of industrial development at district level is studied in the framework of a multiple regression model using this index as the dependent variable. Appropriate policy conclusions have been drawn in the final section of the paper.

#### II. Spatial Pattern of Industrialisation

listrictwise composite index of industrial development has been worked out for 55 districts of U.r. for
the year 1980-81 by the method of principal component
analysis. The composite index is based upon the following
8 indicators revealing the level of factory sector manufacturing activities in the State at the district level:

- x, : Factory workers per lakh of population.
- x, : Value of factory sector output per capita.
- x3 : Factory workers as percentage of total industrial workers.
- x4: Factory workers in the district as percentage of total factory workers in the State.
- \*5: Proportion of registered manufacturing income to total district income (commodity producing sectors).
- x6 : Registered menufacturing income as percentage of total manufacturing income.

x7 : Value added per worker in factory sector.

X8 : Consumption of electricity per industrial worker in industry.

The composite index of industrial development for each district has been given in Appendix I. It may be observed that the districts of the Western region lend the pace of industrial progress in the State with a few exceptions. The classification of districts according to the composite index reveals that the industrially most developed districts in the State include Chaziabad, Kangur, Bucknow, Agra, Meerut and Bareilly whereas the districts of Ballia, Banda, Jalaun, Azamgara, Almora, Garhwal, Fratagara and Jaunpur fall in the bottom level of industrial development.

#### III. Determinents of Industrial Development

The level of industrial development in a region or economy is determined by a complex of variables working on both the demand and supply sides. These variables may be conveniently grouped into five categories, namely level of demand, agricultural linkages, economic infrastructure, social infrastructure and urbanisation.

Level of Demond - In adequate level of demand for manufactured goods has a significent role to play in attracting industries to a region. The economics of large scale production are generally associated with the size of the

market<sup>2</sup>. Moreover, since the pattern of demand in a given region is determined by the pattern of income distribution by the region, income distribution too directly affects the pattern of industrial development<sup>3</sup>.

Assicultural Linkages— The degree and nature of interdependence of different sectors of an economy play an
important role in economic development<sup>4</sup>. The linkages
between agriculture and industry can be studied from both
the demand and supply sides. Supply side linkages between
agriculture and industry emanate/from the role of agriculture as supplier of wage goods and industrial raw materials.
The demand side linkage, on the other hand, emanates through
the role of agriculture in creating finel demand for
industrial output by generating income.

Economic and Social Infrastructure—In order to induce the industrial activity in an economy the availability of certain infrastructural facilities is a basic necessity. An adequate supply of pover, transport, finance, marketing facilities, etc., is necessary for location and growth of industries in a region. Similarly, social amenities like schools, hospitals, communication, entertainment, etc. also affect the locational decisions of entrepreneurs.

<u>Urbanisation</u>- The size of urban population plays a significant role in determining inter-regional pattern of industrialisation. The role of urbanisation in inducing

industrial development in a region may be explosised from both the demand and supply sides. Whereas the process of urbanisation in a given region generates demand for industrial output in the region on the demand side, on the supply side it is associated with the economics of scale and economies of localisation.

#### IV. Correlation andlies

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A total of 40 variables, representing the above mentioned five categories, have been identified for the purpose of our analysis. Table 1 lists these variables and shows the values of tasiz coefficients of correlation with the composite index of industrial development. As expected, there is found a positive and significant correlation between industrial development and met out, ut from the commodity producing sectors per capita-which is taken as a proxy for the level of demand. Among the variables representing ouricultural linkage we find that the commercialisation of agriculture, through input linkages, plays a role in industrial development at the district level. It is, however surgrising to find that the correlation of the gross value of agricultural output percapita with industrial development, though positive, is not significant. Thus the linkages between agriculture and industry at the district level in U.F. are found to be weak, particularly on the demand side. This is

## Table-1

# Determinants of Industrial Devolument at District

Cox		elation between composite Index(y) Co end	rrelation coefficient (r)
×1	63 63	Net output from compelity producing sectors	0.5337*
×2	1	fercentage of area under non- foodgrain crops to total cropped area	0.3982*
×3	:	Gross value of agricultural output per capita	0, 1590
×4,	\$	Leigth of pucci roads per 100 sq.lm. of area	0.4123*
×5	*	Number of bank branches per lakh of population	0,6124*
×6	*	Per capita consumption of electricity	0.5658*
X-7	0 2	Literacy percentage	0.3534*
8 <sup>K</sup>	*	Number of scats in technical education institutions	0.4278*
× <sub>a</sub>	*	Degree of Urbanisation	0.6955*
		Proportion of population living in towns of population 50 thousand and above to total population.	0.7027*

<sup>\*</sup>significant at 5 percent level of significance.

indicative of the low level of agricultural development in the State and the poor purchasing power of its agricultural classes.

positive correlation between industrial development and economic infrastructure, i.e. the availability of transport, banking and power facilities. Variables representing social infrastructure, viz. literacy level and facilities for technical education are also found to be positively and significantly associated with industrial development at the district level, though the value of the correlation coefficient is not as high assa in the case of the variables representing economic infrastructure. A strong positive association between urbanisation and industrial development may further be observed which is in tune with the theory of regional development.

### Multiple Regression Analysis

The relationship between industrial development and selected variables has been further probed in the framework of multiple regression analysis. For this purpose five different linear regression models incorporating selected explanatory variables at each stage were sum and the results of the analysis have been given in Table-2. The explanatory power/different regression models is found

to be very high. Thus all the 10 explanatory variables in Model V together explain 80.4 percent of the total variation in the level of factory sector development at the district level in the State. The coefficients of five variables in this model have the expected positive sign and four of these are also found to be statistically significant. This shows that the industrial development in the State at the district level is basically explained in terms of per capita output  $(\mathbf{x}_1)$ , transport facilities  $(\mathbf{x}_4)$ , evaluability of power  $(\mathbf{x}_5)$  and the proportion of population living in large towns. It is significant to abserve that it is not the simple index of urbanisation  $(\mathbf{x}_9)$  but the growth of big towns which significantly affects the level of industrial development in the state.

It is interesting to note that the coefficients of the remaining five variables in Model V have unexpected negative signs. However, as these coefficients are not found to be statistically significant, their 'wrong' signs are hardly a matter of concern<sup>8</sup>. This should not detrect us ther fore from our explanatory model, nor this should cost doubt on the expected a priori relationship between industrialisation and selected variables.

Instead, the weak impact of these variables on industrial development at the district level reflects an overall low level of infrastructural development and general socio-economic beckwardness of the State. Alternative specifications for some of the variables were also tried

but that did not raise the explanatory over of the model. Thus, signs of the regression coefficients become positive on replacing gross value of agricultural cutfut per capita (x3) by gross value of agricultural cutfut per hectare and the number of bank branches per lake of population (x5) by Credit-deposit ratio while leaving the value of R2 more or less unchanged.

Moreover, social infrastructure, as revealed by literacy rate (x7) and facilities of technical education (x8), is not found to play any significant role in industrial development at the district level as there was no marked reduction in the value of R2 when we deleted those two variables from the analysis (Model IV). Again, deletion of variable x3 which represents demand for goods and services by agricultural classes did not affect the model much (Model II). The important role of the population in large towns in industrial development is, however, highlighted by a large drop in the value of R2 on dropping variable x40 from the analysis (Model I).

## VI. Conclusion

Several important conclusions from the policy point of view emerge from the above analysis of the determinants of industrial development at the district level. Firstly, the growth of large towns considerably affects the growth of factory industry. Secondly, economic infrastructure, particularly power and transport, has a positive impact

Table 2

Linear Multiple Regression Analysis of Determinants of Industrial Development at the District Level

	Variables			MODELS		<b>李孙林林李孙以小孝明郭政宗宗中心心心心心</b>
		1		711	1	**************************************
	Constant Term	(-)2.7500	(-)4.2768	(-)3.8743	(-)3.8316	(-)3.1271
	Net output from commodity producing sectors	0.0044		0.0033	0.0044	0.0048 (4.36)
<b>:2</b> 1	Percentage of area under non-food grain crops to total cropped area		0.0456 (1.73)	0.0644 (2.15)	0.0584 (1.97)	0.0545
5*	Gross value of agricu tural output per capi	a-(-)0.0020 ta (1.54)			(-)0.0019 (1.73)	
c4 2	Length of pucca roads per 100 sq.km.of area		0.0177	0.0176	0.0341 (1.46)	0.0555
451	Number of bank branch per lakh of populatio	es D			(-)0.2603	(-)0.2203 (1.20)
٠ <b>6</b> :	Fer capita consumption of electricity	n 7.6221 (3.96)	4.8928	4.5327 (3.15)	4,6778	4.7236 (3.43)
	Literacy percentage					(-)0.0493 (1.62)
<sup>1</sup> 8 3	Number of seats in te nical education institutions	ch-				(-)0.0006 (1.20)
<b>5</b> 9:	Degree of Urbanisation	0				(-)0.0600 (1.04)
×10	Proportion of populat living in towns of po lation 50 thousand an	yu-	9.0427 (4.98)	8.2779 (4.37)	9,7385 (4.63)	17.3759 (2.84)
	above to total popular R2P	0.4788 (17.54)	0.7550 0.7300 (30.20)	0.7633 0.7337 (25,80)	0.7744 0.7403 (23.05)	0.8036 0.7590 (18.00)

Note: 1. Figures in the parentheses give t-values 2. The number of districts is 55.

on industrial development. Thirdly, social infrastructure at the present level does not have a strong association with industrial development at the district level. Fourthly, while agriculture-industry linkages are some what significant on the supply side, they are weak on the desend side, reflecting thereby low purchasing power of the rural masses in the State. Finally, the supply side factors seem to be stronger than those operating on the demand side in explaining variation in industrial development.

The above analysis leads to the important policy suggession that measures for defused industrialisation simultaneously in all areas are not likely to succeed in promoting industrialisation in industrially backward districts. For promoting rapid and regionally balanced industrial development the planners should, therefore, concentrate their efforts on selected towns with population around 50,000 and above. With the provision of package of certain infrastructural facilities these towns may then develop the potential to act as focal points of industrial and overall development of their surrounding regions.

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- 5. See K. Wadhva and S. A. Kashyap, 'Inter Regional Industrialisation in India: Role of Urbanisation and Urban Structure' in G.P. Misra (ed.). Regional Structure of of Development and Growth in India. Vol.1, Ashish sublishing House, 1985, pp.331-50.
- 6. Although the problem of multicollinearity is more serious in time series rather than cross-section data, it is not quite uncommon in case of the later. In the present analysis, however, the correlation coefficients (r)among explanatory variables satisfied the Klein's rule R2 r2 showing that collinearity was not harmful to any considerable degree in case of our model. See A.Koutsoyiannis, Theory of Econometries, Macmillan, 1978, ch.11.
- 7. For similar results at all India level see Wadhva and Kashyap, And France
- 8. For detail see J. Hebden, Statistics for Economists, Heritage Publishers, 1982, p.113.

Appendix I

Ranking Districts According to Composite Index of Industrial Development, 1980-81

District	Composite Endex	Marine and the same and the sam	District	***	Composite Index	Renk
Chaziabad	9.7410	1	Uttarkashi	( )	0.6840	233
Kanpuz	5.0317	2	Mainguri.	(-)	0.7304	29
Saharenpur	4.0327	3	Borobenki	(-)	0.9158	30
Dekrodun	5.5421	4	Bast1	( ** )	1,0227	51
Lucknow	3. 0430	5	Bul. and theh	1.(~)	1.0421	32
Muzaffamog	ar 2.6481	6	Mathurn	()	1.0536	33
Mirzopur	2.0299	7	Falzabad	()	1.2447	34
Agra	1.9495	8	Etewnh	(-)	1.2814	35
Bijnor	1.9372	9	Behreich	(-)	1.2919	36
Meerut	1.6090	10	fithernger	h(+)	1.3429	37
Sureilly	1.5213	11	Tehri	(~)	1,3493	33
Neinital.	1,4648	12	Ghezipur	(-)	1.4457	39
Jhansi.	1.2555	13	nzangoria 💮	(-)	1,5261	40
Deorda	0,598	14	monia	()	1.5329	41
Al.1.ahabad	0.9301	15	Garlwol	(+)	1.5886	42
Gorakhp <b>ur</b>	0.7846	16	Etah	(-)	1.5891	43
Hlibhit	0.7225	. 17	Ha <b>rdoi</b>	()	1.6386	44
khe <b>ri</b> .	0.4371	18	Ludaun	(-)	1.8265	45
Rompur	0.,3726	19	Fatehpur	(-)	1.8533	46
Gonda	o.3229	20	Farrukhaba	d(-)	1.8911	47
Verunasi.	0.2926	21	Fratupgorh	(-)	1.9731	48
bedaberoil	0.2770	22	Jawayur	(-)	1.9957	49
Rae Boreli	C.0316	23	Lalitpur	(+=)	2.0742	50
Shahjahaapu	r(-1)0.1357	24	Hemirpur	(-)	2.0967	51
/ligarh	()0.3722	ප	Sultengur	()	2.1403	52
Unngo		26	Banda		2,1491	53
	(+)0_5183	27		•		

493.000.000				·····································	<b>(指導:衛衛等)</b>
District	Composite Index	Rank	District	Composite Index	Rank
			Jaleun	() 2.1530	54
1982 - 1982 (1982) 1982 - 1982 (1982)		전하는 이 글로 2001의 및 함 2012년 - 100일 - 100일 2012년 - 100일 - 100일 - 100일	Dallia	(-) 2.2107	55

Source: Rakesh Kumar, Regional Imbalances in Industrial Development in U.F., 1967-81 - A Study of the Factory Sector, unpublished Ph.D. Thesis substituted to Lucknow University, 1988, p.412.

# STUDY OF THAT PRADESE

## V.S. SINGI

Uttar Fradesh is one of the relatively less developed States in the country. Within the State also there is such disparity in the levels of economic development of different regions. For purposes of planning and development, the State is divided into live regions, viz., (1) Eastern, (2) Hill, (3) Bundelkhand, (4) Central and (5) Western. The Eastern region includes 19 districts, Bushelkhand comprises 5 districts of Chansi Division, Will region includes 8 hill districts, Central region consists of 10 districts, whereas Western region includes 21 districts of Agra, Spaceilly, Moradabad, and Meerut Divisions. The districts included in different regions are shown in Appendix-1. In this Paper an attempt has been made to pirpoint the wide variations in the levels of development among the five regions in the key sectors of the economy and to broadly indicate the strategy that should be adopted for reducing the existing imbalances among these regions.

# Density of Population

2. The eastern region is the most densely populated among all the five regions of the State. According to 1991 Census, the density of population of the region was 613 per square kilometer as against for the State. Bundelkhand, having a density of 228 per sq. km., is not heavily populated and the hill region, where density is only 115 per sq. km., is sparsely populated. The density of Central and Western region is 528 and 601 respectively.

<sup>\*</sup>Director, State Planning Institute, U.P., Ducknow. The views expressed in the Paper are of the author in his personal capacity and do not commit the Insitute in any way.

#### Agriculture

3. Agriculture is the main-stay of the population of the State but dependence on agriculture is more pronounced in the three recognised backward regions, viz., eastern, hill and Pubdelkhand, as is evident from the following figures of 1981 Census:

How ett for the his till the t		at the last the last to the last are the St. St. The Last ten to	ing a number of the state of th
Region	Percentage of agricu	rain workers	engaged in
	Cultivators	Agricultural Labourers	Total
1	2	3	4
Eastern Fill Bundelkhand Central Western Uttar Pradesh	59.5 63.8 57.2 64.4 55.7 58.6	19.6 5.5 21.2 11.4 15.4 16:0	79 1 69.3 78.2 75.8 71.1 74.6

4. The above table reveals that there is heavy concerntration of agricultural labourers in eastern and Bundelkhand regions where more than 1/5th of the workers are agricultural labourers. Though an over whelming majority of the Workers in the eastern region is dependent on agriculture, cultivable land per agricultural worker is the lowest (0.69 hectare) in this region, as compared to other regions of the State. The corresponding figures Bundelkhand, Western and Central regions are 1.84, 0.88 and 0.81 hectare respectively. The data about the size of holding, as given in Appendix II, reveal that the small holdings are predominant in eastern, bill and Central regions. In the eastern region, more than 81% of the total holdings are less than 1 ha and as high as 93% of the heldings are less than 2 ha. In case of the hill region the corresponding figures are 71% and 88% respectively. It would be useful to note here the following observations made in the Patel Committee Report in this connection.

In eastern districts the agricultural income, which is low for each acre of the cultivated Tand, gets further reduced when shared by more persons. Not only the cultivated land is less for person or per family but its distribution as very showed with the roult that a very large number of families at the lower and would have much less income than indicated to access income.

## Foodgrains Production

Esstern and Central regions are deficient in the matter of production of foedgrains, whereas the remaining three regions viz. Hill, bundelkhand and Western are surplus. It needs to be pointed out that a high figure of foodgrains production in the hill region is due to the fact that the region includes Nainital and Debradum districts also and the production in the plains of these two districts contributed largely to the total production in these districts.

	Region	Population of the region as percent- age of State's population(1991)	Foodgrains production in the region as percentage of total production in the State(1986~87)
	1	2	3
Charles and all all	Eæstern Hill	37.9 4.2	32.2
	Bundelkhand	4.8	6.6
	Central	17.5	16.4
5.	Western	33.6	39 <b>.9</b>
	State	100.0	100.00

#### Average Yield

6. The average yield of important crops of different

regions is given in the following table :-

de les se	Rogion	Rico	r Hectare ( In	Maize	Sugarcane
Secretary	reservation and an an an and and an	The state of the s	The Fig. Thank Service Specific Service Servic	nd a faire gland from the entire field from the state of	gan garr jest gest den vert gije nat for den den den de f
2.3.4.5.	Fractions Hill Bundelble Central Western Uttor	11.40 18.87 pd 9.19 10.46 18.67	15.82 15.39 13.78 13.19 23.41 19.32	9.39 15.56 11.89 19.61 14.16 12.27	456.83 581.95 427.83 466.53 523.58 505.09

7. The valle he seem from the above details that in the castern and Bundelkhand regions, the yield of all the important crops is lesser than the State average. It is interesting to note that the hill region accorded the highest per hectare yield among all the regions in respect of rice and maize but in case of wheat the yield was lower than the State average. In Central region, the average yields of all the important crops were lower than the State average. Western region had the higher yield than the State average in respect of all important crops.

#### Trrigation

8: The following figures of the gross irrigated area as percentage of the gross area sown indicate that irrigation facilities are least developed in Bundelkhand region, where the irrigated area was only one fourth (25.2%) of the sown area. The irrigation facilities in hill region are also too inadequate as only one third (32.6%) of the area sown is irrigated. The percentage of irrigated area is relatively much higher in Westernregion, where nore than three fourth (78.6%) of the area sown was irrigated. The corresponding percentages in eastern and Central regions were 46.1 and 54.4 respectively.

Region	Percentage of gross area irrigated to cross area sown ( 1987-88)
	<b>2</b>
l. Fastern	46.1
2. H.111	32.6
3. Bundelkhand	
4. Certral	54.4
5. Mestern	H. B.
Utter Fradesi	

#### POMET

9. Fower facilities form a base for agricultural and industrial development of a region. The per capital consumption of electricity, as shown below, can provide an idea about the extent of use of power facilities available in different regions of the State:

Region	Per capita consumption of electricity (KWH) ( 1987-36)
and the second diagnosis and the second diagno	And the second s
Eastern	126.84
nill	169,42
Bundelkhand	54.98
Central	114.23
Western	1 169.16
Uttar Fradesh	138.00

- 10. The above data indicate that the power facilities are too inadequate in Bundelkhand region, where the percapite consumption was the lowest. The highest per capita consumption of electricity was in the hill region but this is because of too low density of population in the region.
- 11. The details of villages electrified, as given below, show that rural electrification facilities are least developed in Fundelkhand region, where only 58.5% of the

villages could be electrified by the end of March 1990. The next is order were Central (63.0%), Hill (69.0%) and eastern region (30.2%). Western region ranked on the top, where the percentage of electrified villages was 81.4

J. Gref Con	Ferceotage of v) llage: (1982-90)	s electrified
4.		gar at the highest for the highest hand the highest for the hi
Bastern Hill Bundelkhand Centzal Western Uttac Pradesh	70.2 69.0 58.5 63.0 81.4 71.4	

#### Industries

12. As idea about the industrial development scenario of different regions can be had from the following table, showing the number of workers employed in registered factories:-

Region	Number of workers per lakh of population employed in registered factories (1985-86)
The second secon	2
Eastern	241
HILL	546
Bundelkhand	229
Central	633
Western	683
Uttar Fradesh	559
Note that they that the till give that like they were not the date that or	THE CASE WAS DO THE TO THE

13. The above table reveals that industrial sector of Bundelkhand is most undeveloped among all the regions of the state. The next in order are eastern and hill regions. Central region recorded the highest number of workers engaged in registered factories. This is obviously due to inclusion of Kaupur in Central region.

#### Roadu

14. Reads fore an important infrastructure for accelerating the development of an area. The relative position of road and rail lengths in different regions a indicated in the following Tables-

Region	Length of metrilled road per 1900 sq. - hrs. of area (kms.) (1987-88)	
The state of the second st	2	tion 1970 to 2 the March (1984 to 1984) According to the care happing on growing the color tag. In the case tag. T
1. Eastern 2. Will 3.Bundelkhand 4. Central 5. Western Ottor Fradesh	231.1 :13.1 162.5 :202.4 :253.9 :223.0	37.2 5.2 23.2 39.6 24.5 29.9

15. It would be seen from the Contents of the above table that Bundeikhand region is lagging behind all the regions, so far as road facilitiess are concerned. The length of road per 1000 sq. km. of area in this region in 1987-88 was 162.5 kms, as against the State caverage of 223.0 kms. The next in order were Central, Hill and Pastern regions where the lengths of roads per 1000 sq. km. of orea were 202.4 kms, 213.1 kms and 231.1 kms respectively. Western region is most advantageously placed, where the length of metalled rosas per 1000 sq. km of area was 253.9 kms. In the matter of railway lines also, Bundelkhand region ranked on the lowest ladder excluding the hill region. The length of railway lines per 1000 sq. km. of area in Bundalkhand region during 1987-88 was 23.2 kms., as against 34.5 kms. in Western region, 37.2 kms. in Eastern region and 39.6 kms. in Central region.

#### Literacy

16. A pernsal of the Contents of Item no. 14 of Appendix III reveals an interesting fact. The hill region, which is one of the three regions recognised as backward, ranked on the top, where the literacy percentage was 39.30.

Bundelknen region, which is also one of the three backward regions, occapies the second place with a literacy percentage of 18.82. The eastern region was placed in the lowest ladder, where literacy percentage was 24.28. As regards lamber literacy it was highest in the hill region (24.18%, reflowed to Contral region (15.82%), Western region literacy percentage was the lowest (10.74%) in the Section region.

## Ranking of Region.

levels of detelopment of different regions, as indicated by certain indicators. An attempt has been made to rank the regions according to their levels of development. Among the five regions of the state, the most developed region, with respect to a particular indicator, has been assigned rank no. 1, whereas the least developed region was ranked 5. The total of the ranks, as mentioned at the end of the Appendix, indicated that Western Region is most developed and Eastern region is the least developed region in the State. The hill region and Central region occupied the second and third ranks respectively.

# Development Strategy

18. The foregoing analysis indicates the level of development relating to various aspects of the economy of different regions of the State. It also pinpoints the sectors where a region legs behind the other developed regions. For achieving the objective of balanced regional development, it is essential that Government departments and other agencies engaged in development works should substantially enhance the size of the development programmes of the sector in a region which is relatively

less develope in the respect. The programmed would have necessarily to be based on the felt needs and should be able to colve the upolish problems of the region/ares. In each region the master of the problems and the impediments to repid development in particular fields have to be carefully studied and appropriate measures devised for accelerated development. It is also to be ensured that potentialities of different areas are exploited to the maximum.

19. In the obstern region pressure on land is too heavy. This has to be reduced by establishing agro-based industries and network of small and cottage industries. Development of cottage and village industries on a much larger scale than now can play a vital role in uplifting the economy as well as reducing wide apread inemployment and under employment in the region. The existing production techniques are old and primitive and have not witnessed any improvement over the last several years. There is, thus, a modernise the production techniques and substantially expand the marketing facilities on scientific lines. Lack of finance is another handicap. The provision of credit, expansion of marketing facilties, improvement in skills and information on better techniques can go a long way in increasing the tempo of development of village and cottage indestries in this backward region. The handloom industry is a traditional industry in the region and has tremendous scope for further expansion. A massive expansion of this industry can generate considerable employment opportunities. Carpet weaving at Bhadchi (Varanasi ) and Mirzepur ik internationally famous to, its quality. This industry needs to be developed by ensuring a smooth flow of required firence and adequate supply of raw materials and extension of marketing facilities to the weavers engaged in

it. The yield per hectare of all important cross in this region are ruch below the State average. This should be substantially increased by enhanced use of high yielding varieties seed, chemical derbiliaers and pesticides. The extension age caus working in the agen should intensify the programme of a content of adaption of these improved aquicult i governors ac that cultivecors may convince about of carry of these practices. There should be the wer of some depots in reral areas for the supply of and of non yielding varieties, insecticides. pesticide and armical fertilisers and measures have to be taker o essure that hese inputs are available to the cultivators as the required line and in adequate quantity. Mon-availability of these vital inputs at the required time often mars the incentive of the cultivators to use these inputs. Soitable varieties of paddy for growing in the flooded and deep water areas have not yet been evolved. Effective research is needed in this direction. Similarly, whort direction makes varieties should be evolved, which could be harvested before the advent of floods in the region. It deserves mention that an overwhelming majority of the fatmers in the eastern region falls in the category of small farmers. A real break-through in the agricultural economy of the region can be effected only through the development of small tarmers. The small holdings have to be made economically viable. The production in these small holdings can be increased by ensuring timely and adequate availability of impute like fertiliser, seed, intigation, etc. The Covernment Departments and Financial institutions should extend credit facilities to small farmers on very easy terms, so that they may not be financially handicapped in purchasing inputs like improved seed pesticio a, etc.

20. A major factor seriously affecting the economy of this region is the recurrence of devastating floods. The severity of the problem can be seen from the fact the area affected by floods in the region annually during the period

1984-89 was as high as 7.68 lake hectures. The recoverance of floods and imply results in colossal loss to crops, cattle head and importly, which the inhabitants of this region can hardly absorb of account of their poor incomes but also size their initiative to take other steps for improvement. Much lowest efforts are, therefore, needed to save the redoman by depressed area from this devastation. In formulating the pron, it should be taken into account that floor prevention and control progressme is not confinct any to the Civil works, i.e., construction of bund but is not account works, i.e., construction of bund but is not account and account progressmes should, therefore, include agriculture, soil and water conservation, forest and irrigation works also.

- 21. Large scale construction of roads and bridges is needed to increase communication facilities; which may open up interior kinterlend and quicken the pace of implementation of development programmes in different areas of the region.
- among all the five region has the lowest literacy rate among all the five regions of the State. In order to increase the literacy rate, besides boosting the programme of primary education, it is essential that a massive campaign of adult education is also launched. Special efforts are needed with respect to female primary and adult education, as literacy percentage among female in the region is the lowest.
- 23. An affective strategy for accelerated development of hill areas must take into account the constraints of development and should sim at optimum explaination of vast potentials of the region.

: 12 :

24. On account of undulating topography, rugged terrain varied climate, texture and soils, the hill region suffere from serious constraints of development. factors severely inhibiting the pace of development are : scanty cultivable land, overwhet/ming percentage of small and marginal holdings ( 82%) of the total holdings are less than 2 hectares, of which 71% are/1 ha. and 17% are between ha). difficult agricultural condition. settlement pattern (89% of the villages have population of less than 500), severe soil erosion, inadequate basic infrastructure in terms of all weather roads, irrigation and power, marketing and credit, lack of industrialization and institutional support, dearth of basic facilities like drinking water, public health, particularly in the remote and inaccessible areas, largegestation period of projects and relatively higher per unit cost of infrastructure development and low returns on investment. Inadequate development of technologies suitable for hill areas, unscientific management and land use patterns have resulted in low productivity on the one hand and depletion of resources and ecological deterioration on the other.

25. Experience of development planning during the past has underlined the act that unless programmes based on the concept of 'Development without Destruction' are evolved for the conservation and proper utilisation of resources of the hill areas, not only the problems of hill areas will continue to remain unsolved, but the economy of the plains may also be adversely affected. Conservation and development are twin objectives that can be aimed at simultaneously in the hill region. Development of resources of the hill areas is necessary both for enabling population living in these areas, who are by and large poor, to have their share of the benefits account from modern science and technology and for esfequarding the security and health of the crops cultivated in the adjoining plains.

- 26 Resping in view the ecological vulnerability of the hill areas, which has turned into serious proportion during the past two decades because of increase in the pressure of population and intensive exploitation of natural resources, a high priority needs to be accorded on ecology and on the man.
- 27. The ecc-system of the Himalayan region has been greatly impaired due to denudation of forest, indiscriminate grazing, unscientific land use practices, uncontrolled mining and road construction etc. There is need to balance economic development with the imperatives of environmental conservation and to formulate realistic and manageable programmes for tackling the interlinked problems involved in eco-development. In this background, the eco-development strategy must incorporate (a) protective (b) regenerative and (c) productive measures.
- 28. Special emphasis should be laid to include those schemes which are labour intensive and generate larger employment opportunities per unit of cost, and have direct bearing on the incomes of the people of the area.
- 29. The hill region possesses vast potential for horticultural development about not only aim at increasing the production but should also provide for storage, processing and marketing, so that maximum return of produce could be obtained. A land use survey should form the first step in preparing a proper plan of agricultural development of the area. There is need for much more exploitation of forest resources of the region. Not only the area under forest has to be increased but plantation of species of fast growing and of economic and industrial importance should be undertaken on an extensive scale.

30. A serious problem of the area is out migration of males, which is of sizeable naagnitude. A Study ( Bora ) reveals high incidence of migration in U.P. bills, with 57% of the households reporting out-migration, or the equivalent of 24 percent of the population. In order to combat the problem of our-migration and unercloyment, there is au imperative need for extending a net work of small and cottage industries. Several small and cottage industries, based on locally available rate materials, can also be established which may boost the economy. Water power running to waste can be usefully converted into electricity and programmes of hydro-electric development needs to be greatly accelerated. Tourist industry has immense scope in the bills. The healthy climate, scenic beauty, flora and fauna, great shrines, beautiful lakes, snow views etc. are great attraction to tourists and pilgrims. Drinking water facility is precarious in the hills. People have to go long distances in the difficult terrain for procuring drinking water. Huge investments are necessary for providing this basic amendty.

31. The programmes for Bundelkhand should take into account special problems of the area. The special problems of the area are : poor soil fertility, great paucity of roads in rural areas, acute shortage of drinking water in large tracts, existence of vast areas under culturable waste, lack of irrigation facilities and almost negligible industrial development.

32. The strategy that needs to be adopted for the development of Bundelkhand region is briefly spelt out below:

- 1. Massive efforts are needed to increase the yield per hectare in the area, which is the lowes! among all the regions of the State: Cultivation of cilseeds and pules should be taken up on an extensive scale in order to raise the cropping intensity and also help in overcoming the deficiencies of production of these commedities.
- .2. Taking into consideration the rocky topography and typical soil, having much lesser capacity or moisture retention and irrigation works being

too costly, dry farming is much suited for the area and abould be practised on an extensive scale. The National Buresu of Soil Survey and Land Use Planning, Happur has spelt out, in its study Report entitled. "Land Use Plan for Development of Bundelkhand Region", the desired day-land agricultural technology that reed to be adopted in the region.

- 3. Recent technological advancements have proved than suitable water-whed management techniques can conscrive water and moisture in large quantities to meet the requirements of arable farming. The agricultural production of this region can be enormously increased by adopting latest techniques of water-shed management in the region.
- 4. Horticulture in this area can be developed on commercial lines. Efforts should be made to maximise the production of citrus fruits, vegetables, green peas, ginger and other spices, which are in great demand in the nearby kanpur Metropolitan and Babina Cantonment Area.
- of milch enimals but in view of indigenous breed, the milk yield is extremely low. An acute scarcity of fodder, besides severely affecting the yield of existing milch livestock, also dissuades cultivators for going for improved breeds of cattle. It is suggested that those chunks of cultivable waste, which cannot be brought under afforestation, should be developed into pasture lands. More emphasis should be laid for the cultivation of fodder crops and performal grasses in collaboration with the Central Grass Land and Fodder Development Research institute. Jhansi.
- f. Irrigation facilities need to be substantially increased. State and private tubewells may be installed, as it is now possible to instal these works, with the introduction of latest techniques of remote sensing and using deep octing rig machines ( like In-well and D.T.H. Fig Machines).
- 7. The region has great paucity of bridges, which inhibits its exposure with inside and outside towns and market centres. There is, thus, importative need of constructing a number of bridges over important rivers, so that there may be speedy in-flow and out-flow of passenger and goods traffic, within and outside the region.

- 8. Sundelkhard region is often affected by droughts. There is imperative need for formulation of Master Plans of the affected areas, which may ensure a synchronisation of the progremmes of agriculture, animal husbandry is lest on power etc. The development and relief plant is of the affected areas should be integrated.
- The region possesses some minerals like Bauxite, Evrophyllite, Ruck phosphate and Silica sand. Fed sand and soft rocks are also found. The industrial divelopment plan of the area should, therefore, take into account these locally evaluable reampaterials.
- 33. The foregoing analysis pertaining to inter-regional variations in levels of development reveals an interesting fact. Though the Central region has not been included by the State Government in the three backward regions, the region lags much behind the State average in case of a number of indicators and these are:
  - Percentage of agricultural workers to total workers
  - 2. Cultivable area per agricultural worker
  - 3. Percentage of holdings below 1 hectare
  - 4. Multiple cropping
  - 5. Per hectare gross value of agricultural output
  - 6. Electrification of villages
  - 7. Length of metalled roads
  - 8. Literacy percentage
- 34. There is, thus, an imperative need for further acceleration of developmental efforts towards the aforementioned aspects in the Central region for achieving the objective of balanced regional development.
- 35.In the Western region, population growth rate during the decade ending 1991 has been higher than the State average. It is, therefore, essential to intensify the family planning programme in the region. In the field of

education also, the region is lagging behind hill and Bundelkhand region, maken fall in the category of backward regions. It is, therefore, essential that programme of literacy, with a sharper focus on adult literacy, is launched on a massive scale in the region.

## Concluding Remarks

importance of reduction/removal Tile inter-regions: disparities in the levels of development in a state, which is pot only in the interest of the respective regions but also for the economy of concerned State as well as that of the Nation, cannot be overemphasized. Though in each of the successive five year plans, the subject of Eqlanded regional development finds a prominent place in the set objectives, the efforts made so fer have touched only the fringe of the problem. The problem of removal of regional imbalances, which primarily involves acceleration of pace of development of the backward areas, is so enormous that the Central Government has necessarily to come up in a big way to make huge investment in these areas to boost up their economy. Not only a substantial raising of investment is necessary but what is more essential is the reorigination of the National policy, which may result in a real break-through in reducing inter regional disparities. So far as the role of State Government is concerned, if should be appreciated that the development of different regions and the State's ecoromy have to be viewed as parts of a single process. The progress of the State's economy will be reflected in the rate of growth realised by different regions and, in turn, greater revelopment of resources would contribute towards reising the rate of progress of the entire State. The fact that the removal of regional disparities in Ottar Pradesh is not only in the interest of the State but is also in the " larger interest of the country has to be appreciated in as much as the depressed economy of the State, which accounts for one tixth of the population of the country, would obviosly act as a drag in development of the national economy.

#### APPENDIX - I

# Districts included in different regions

- (1) Fastern Feglon
- (1) Allebahad (2) Azamgarh(3)
  Hebraich (4) Sallia (5) Basti
  (6)Deoria (7)Faizabai (8)
  Chazipur (9) Gonda (10) Gorakbpur
  (11) Jaumpur (12) Mirzapur (13)
  Fratapgara (14) Sultanpur (15)
  Varangsi (15) Mau (17) Siddarth
  Magar (16) Mahrajganj and (19)
  Sone-Bhadra.
- (2) **20nd** (1) bere Region
- (1)Banda (2) Hamirpur (3) Jalaun (4) Shanel and (5) Lalitpur
- (3) Milj Region
- (1) Almora (2) Fithoragarh (3) FauriGarhwal (4) Chamoli (5) Nainital (6) Tehri--Garhwal (7) Uttar Rashi (8) Dehradun
- (4) Central Region
- (1) Farabanki (2) Fatebpur (3)
  Hardoi (4) Kanpur Nagar (5) Kanpur
  Dehat (6) Kheri (7) Lucknow (8)
  Racbareli (9) Sitapur and (10)
  Unnac
- (5) Western Region
- (1) Agra (2) Aligarh (3) Bijnor (4) Budaun (5) Bareilly (6) Bulandshahr (7) Etah (8) Etawah (9) Farrukhabad (10) Mainpuri (11) Mathura (12) Meerut (13) Moradabad (14) Muzaffarnagar (15) Rampur (16) Pilibhit (17) Saharanpur (18) Shahjahanpur (19) Ferozabad (20) Ghaziabad (21) Hardwar

APPENDIX - III

Regional variations as revealed by some indicators

21:	Item				REGIONS		
ġ		[ [	Eastern		Bundelkhand	Central	Western
i.	2	i m	***************************************		9		
l A	Density of population per sq. km. (1991) No.	471	(2)	115	228 (2)	<b>528</b> (3)	601
Ň	Percentage increase in 1991 over 1981 (%)	35.16	26.24	21.46 (D)	23.58	23.48 (2)	25.55
m.	Percentage of agriculture workers to total main workers (1981) &	9. 7.	<b>79.1</b> (5)	(2).5	78.3	75.7	. 59.1 (1)
<b></b>	Cultivable area per agricultural worker (1986-87) (ha)	£8. <b>6</b>	<b>69</b> .(5)	<b>e</b> (0)	<b>38.</b> (1)	0.81	(;.88 (3)
wn .	Net area sown per capita rural population(1986-87) (ha)	87. 0	(5)	(4)	0.43	5T (6)	0.20
v.	Holdings below 1.0 ha as percentage of total no. of holdings (1985-86 census ) (%)	9 0 0 1	81.2	70.9	47.3	71.5	65.0
	Percentage of gross area irrigated to gross area sown (1967-88)(%)	56. 8	46.1 (3)	32. <b>6</b> (4)	25.2	<b>53.8</b> (2)	Ħ Ħ
œ.	Percentage of area sown more than once to net area sown (1987-88)(%)	9	<b>48.5</b> (3)	. £ . (1)	11.0 (5)	33.2	49.0
o o	Culturable waste land as percentage of net area sown (1986-87) %	<b>4</b> 6	r E	(5.3 (5)	<b>4.4</b> ( <b>4</b> )	4.6	2:0

VERKADIK - II

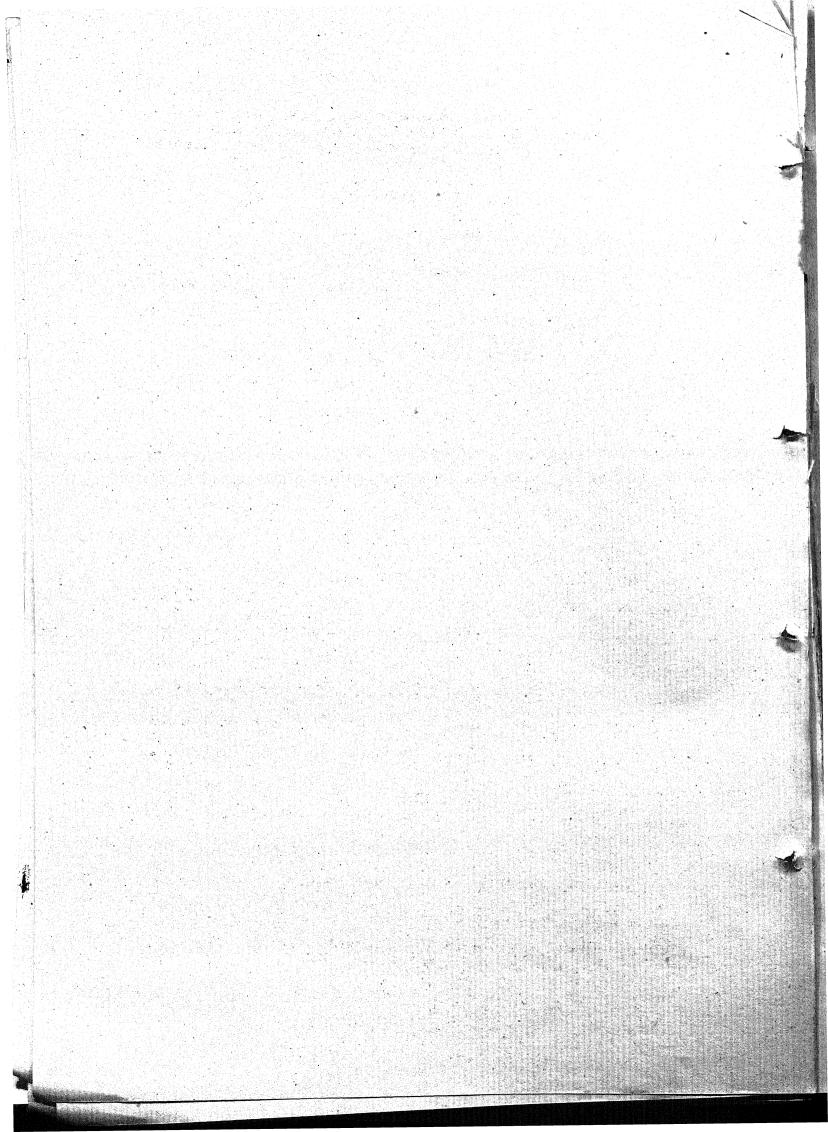
Percentage Distribution of operational holdings in

	Total	0.00L	0,001	OFOOT	0.001	0.001	0.001
	apove						
• •	5a8 0.01	€.0	2*0	€*0.	9°1	z.0	€.0
•	0.01-0.p	3.2	9.1	ο, ε	70°6	9°Z	5.4
• (	0.4-0.5	£.8	2.2	0.6	6 <b>.</b> 91	<b>7</b> .8	₽"TT
• 7	0.2-0.1	9*5[	8.11	8.9L	8.65	E*4I	8.81
	BeTOMT.0	9.27	Z, [8	6.07	ε.Υ.	8.17	0.29
	2	ε		<u> </u>	9		8
	<b>(P4)</b>				р <b>ля</b> ды	ه هم المحمد	and the day and the transition of
• 01	state estate		938 <b>9</b> 3	(LtH nr	(abmua )	- Central	. Wester
٠٦:	Red Ton Suc		ifequa).	of lo	sprible	(8)	

Source : Agriculture census in Uttar Pradesh, 1985-86

	m			9	£	
10. Per hectare (Net area sown ) gross value of agricultural output in 1987-88 at 1980-81 prices (B.)	5469	<b>5096</b> (3)	5765 (2)	2960 (5)	4887	6859
11. Percentage of villages electrified (1989-90) at 12. No. of workers per lakh of population employed in registered factories (1986-87) No.	71.4	70.2 241 (4)	69.0 (3) (3)	58.5 (5) (5) (5)	63.0 (4) (33 (2)	81.4 (1) (2) (1)
13. Length of metalled roads per 1000 Sq. km. of area (1987-88)(km.)	223.0	231.1	213.1	162.5	202.4	253.9
14. Percentage of Literacy (1981)(%).	23.16	4.0 5.0 00	38.30 3	28.92 (2)	27.72	28.19
(a) Male	38.76	37.6	S. 3.3.0	41.79	or Fr	30.74
(D) Female	14.04	*. 0	4. 3.	73.92	72.62	15.55
Total of renk			200	8		
	おいかのないはない				and the second term of the secon	高 (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)

Figures in parantheses denote the rank of the region with respect to the level of development. The nest developed region has been assigned region's rank has been shown as five (5).



GROWTH PERFORMANCE AND INDUSTRIAL DEVELOPMENT: A
COMPARATIVE STUDY OF UTTAR PRADESH IN RELATION TO
REST OF INDIA AND THE INDIAN ECONOMY, 1960-61 TO 1985-86

R.S. Tiwari\*

#### I. Introduction

The increasing inter-state industrial development disparity has now been recognised as an integral feature of the national economy. Studies suggest that Maharashtra, Gujarat, Haryana, Punjab, Tamil Nadu and West Bengal were the most industrially developed states, Madhya Pradesh, Rajasthan, U.P., and Jammu and Kashmir were the industrially most backward states. In 1981, U.P. was placed as second most industrially backward state of the country after Jammu and Kashmir. 2 Several factors like inadequate availability of infrastructure, low level of urbanisation, low level of agricultural development, inadequate policy supports and unfavourable socio-political conditions were held for the industrial backwardness of the state. Variations in industrial development may be due to one or all the factors. Over time, it is possible that the impact of one factor is over shadowed by another or all factors start playing equally important role. Thus, it is a question of empirical investigation to analyse and examine the role of different economic and non-economic factors on the observed industrial development. The present paper in this direction

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seeks to examine, (i) growth performance, (iii) industrial development performance, (iii) relationship between observed state of industrial development and independent factors and (iv) providing certain policy measures consistent with industrial development of the state economy. Focuss of the discussion is on the state of Uttar Pradesh in relation to rest of India and Indian economy. Inclusion of rest of India is on account of the fact that national average figures have also been affected by the state average.

#### II. Growth Performance : A Comparative Analysis

Ideally, there is no universally acceptable criterion or criteria for appropriate portrayal of growth performance either at the state level or at the country level. Researchers on the basis of the availability of data, try to examine the growth performance. In the ongoing exercise, growth performance has been examined on the basis of (i) sectoral contribution of the state, (ii) results of trend regressions and (iii) average rates of growth. Study covers the period 1960-61 to 1985-86 at 1970-71 constant prices. Statistical Abstract, U.P. published by Economics and Statistics Division, State Planning Institute, Lucknow and India's Data Base, The Economy Vol.I and II published by H.L. Chandhok and The Policy Group, New Delhi, 1990 form the main sources of information.

Table 1 shows that share of U.P. in country's NDP. It declined steadily from 13.63 per cent in 1760-61 to 12.33 per

cent in 1970-71, which further slipped back to 12.03 per cent in 1980-81. The relative share of U.P. in 1985-86 was 12.06 per cent. A similar pattern also followed in the primary and in the tertiary sectors. Over the period 1960-61 to 1985-86, the relative share of U.P. in India. Primary sector stagnated at over 15 per cent, while in tertiary sector it declined from 12.25 per cent to 8.21 per cent. In sharp contrast to these, relative share of U.P. in India's secondary sector increased from 8.51 per cent in 1960-61 to 9.35 per cent in 1970-71, which further improved to 10.91 per cent in 1980-81 and 12.77 per cent in 1985-86. Thus, the performance of U.P. has been farely satisfactory in secondary sector, while poor in case of primary and in the tertiary sectors.

Such a finding was also corroborated by the results of the trend regressions. Trend regressions in semi-log linear form were estimated separately, treating log of different variables as dependent, while time as independent explanatory variable (Log y = a + bt).\* Regression equations were estimated separately for India, rest of India and for the U.P. at 1970-71 constant prices over the period 1960-61 to 1985-86. Analysis of Table 2, 3 and 4 shows that rates of growth of NDP were lower in U.P. vis-a-vis the rest. This was true for the periods, 1960-61 - 1970-71, 1970-71 - 1980-81 and for the period as a whole (1960-61 - 1985-86).

<sup>\*</sup> Trend regressions estimated for various sectors and subsectors have not been given due to space constraint.

However, during the period 1980-81 - 1985-86, rates of growth were higher in U.P. than that in India but reverse was true vis-a-vis the rest of India. However, in remaining subperiods, rates of growth were lower in U.P. vis-a-vis the rest. Over the long period (1960-61 - 1985-86) NDP grew at the rate of 4.61 per cent in U.P., which was lower considerably than that in India (5.71 per cent) and the rest of India (5.89 per cent).

Analysis per se fails to explain the rates of growth for the individual sectors. We thus examined trend rates of growth as well as yearly average rates of growth for different sectors as well as their sub-sectors. It was found trend rates of growth of NDP from the primary sector were lower in U.P. from 1960-61 to 1970-71 vis-a-vis the rest but during 1970-71 to 1980-81, it was equal in U.P. and in India. During the whole period (1940-61 - 1985-86) trend rates of growth of NDP relating to primary sector were lower considerably in U.P. than the rest. Average rates of growth, by and large, reinforced the above observations for the period, 1960-61 - 1970-71, but for rest of the periods, a disquietening feature emerged. It may be recapitulated that poor growth performance observed in primary sector may be due to the nature of growth performance of its sub-sectors, like, agriculture and mining, quarrying, dairying etc. It was found that during 1960-61 - 1985-86, trend rates of growth of from agriculture where much lower in U.P. than that in NDP rest of India, while it was equal to Indian

Trend rates of growth of NDP relating to mining, quarrying etc. were the same both in U.P. and the rest. Average rates of growth, however, showed a disquietening feature as it could not support the earlier finding. Nevertheless, our results showed that growth performance of agricultural sector was poor in U.P. than in the rest, which were primarily the outcome of the poor performance of agriculture and other subsectors over the period under reference.

Growth performance of NDP relating to tertiary sector and its components has also been worked out. It was found that trend rates of growth of NDP of this sector were lower in U.P. than that in the rest. This was true for all the sub-periods and for the period as a whole. Average rates of growth worked out strongly reinforced such empirical finding. Over the period, 1960-61 - 1985-86, NDP from tertiary sector increased by 6.11 per cent in U.P., which was lower considerably than that in India (11.01 per cent) and rest of India (11.69 per cent). This may be outcome of the nature of performance revealed by the different sub-sectors. Of course, it is true. Trend rates of growth of NDP from transport, communication and trade, hotels and restaurants other tertiary activities were lower substantially in U.P. than that in the rest. This was true during all subperiods and the period as a whole. Over the whole period (1960-61 - 1985-86), NDP from transport, communication and trade increased by 9.31 per cent in U.P., which was lower than that in India (9.85 per cent) and rest of India (9.87 per cent). Similarly, respective rates of growth of NDP from hotels and restaurants were lower in U.P. (5.44 per cent) than in India (8.67 per cent) and the rest of India (9.15 per cent). Similar was the case for other tertiary activities as well. This was supported by the fact that NDP from other tertiary activities increased by 5.67 per cent in U.P., which was lower significantly than that in India (23.17 per cent) and the rest of India (39.40 per cent).

Relative growth performance of NDP from secondary sector of U.P. is all the more different than that discussed above. It may be underscored that relative growth performance of NDP from secondary sector was poor during 1960-61 - 1970-71 in U.P., which picked up afterwards. It is satisfying that rates of growth of NDP from this sector were higher in U.P. than in the rest during the period 1970-71 to 1980-81, 1980-81 - 1985-86 and for the whole period (1960-61 - 1985-86). It was substantiated by the fact that NDP from secondary sector increased by 6.36 per cent during 1970-71 - 1980-81, in U.P. which was higher than that in India (4.15 per cent) and rest of India (3.92 per cent). A similar pattern also followed during 1980-81 to 1985-86, when rates of growth of NDP in U.P.(8.74 per cent) exceeded than that in India (5.06 per cent) and the rest of India (4.60 per cent). entire period (1960-61 - 1985-86) NDP increased by 14.13 per cent in U.P. which was higher than corresponding rates of growth in India (8.13 per cent) and the rest of India (7.57 per cent per annum).

A relatively better performance of NDP of the secondary sector in U.P. must have been conditioned by the relative growth performance of its sub-sectors, such as, registered manufacturing, un-registered manufacturing and other secondary activities. Other secondary activities include, construction, electricity, gas, etc. It may be seen that trend rates of growth of NDP from registered manufacturing sector has been higher in U.P. vis-a-vis the rest during all sub-periods excluding 1970-71 - 1980-81. Over the whole period, NDP from registered manufacturing increased at the rate of 15.38 per cent in U.P., which was far higher than that in India (10.25 per cent) and the rest of India (9.94 per cent). A more gloomy picture seems to have emerged in the case of un-registered manufacturing sector. It is satisfying that during all sub-periods as well as for the whole period, trend rates of growth and average rates of growth of NDP from un-registered manufacturing were higher in U.P. vis-a-vis the rest. During 1960-61 - 1985-86, NDP from this sector grew-at the rate of 13.11 per cent in U.P., which was higher than that in India (5.84 per cent) and rest of India (4.96 per cent). More or less, a similar pattern has followed in the case of NDP from other secondary activities, like, construction, electricity, gas, etc. Over the period, 1960-61 - 1985-86, NDP from other secondary activities grew at the rate of 14.29 per cent in U.P. which was higher than that in India (7.09 per cent) and rest of India (6.81 per cent).

Thus, analysis of growth performance per se showed that relative share of NDP in U.P. in India's tertiary sector decreased, while that in primary sector it stagnated over the years. It is satisfying that relative NDP share of U.P. in India's secondary sector improved considerably. By and large, a similar pattern has also followed when growth performance is examined in terms of trend rates of growth and annual average rates of growth. The study thus underlined that growth performance of U.P. with respect of secondary sector was fairly satisfactory than that of the rest. contrast to above, the performance of U.P. in the case of tertiary and the primary sector was poor and discouraging vis-a-vis the rest. Since, the performance of U.P. in terms of NDP from the secondary sector is better, one expects that pace and pattern of industrialisation has been more rapid in U.P. than that in the rest. This issue has been examined in the following section.

#### III. Industrial Growth Performance

Different industrial aggregates, i.e., factory employment, invested capital, output and value added have been generally used to examine the level of industrial performance both at the state as well as at the national level. However, use of output and employment received more weightage than the others. This is so because, "developing countries such as India are characterised by over population, excessive dependence on agriculture, mounting unemployment, low per

capita income etc. Any programmes of industrial development in these countries must, therefore, aim removing these structural imbalances. In this regard, output to raise the national income and per capita income and employment to solve the problem of unemployment and under-employment assume imporance". 1 Such a belief is not always rooted in reality. The relative efficiency or inefficiency of capital ultimately gets reflected on the volume of output and therefore on to value added. Generally, inefficiency of capital would result into the lower level of output, while reverse would be case a firm using efficient capital. Also, the mere generation of employment is not as important as that of the Therefore, any generation. employment productive industrialisation programme, instead of encouraging the spurious or un-productive employment must concern itself to raise the volume of output and value added, the effect of which must percolate down to generate the productive employment.

It has not been possible for us to use the different indicators reflecting the growth of industrialisation. At this juncture, we could only consider the volume of output, value added and the number of factories as indicators of industrial development in U.P. vis-a-vis in Indian economy and that the rest of India. So as to compare the industrial performance of U.P. vis-a-vis India and rest of India, trend regressions in semi-log linear form (log y = a + bt) have been estimated treating separately different industrial

aggregates (output, value added and number of factories) as dependent variable, while time as independent explanatory variable.\* Owing to the paucity of information, this part of empirical exercise covered the period from 1960-61 to 1984-851, which is broken down into 3 sub-periods, such as, 1960-61 to 1970-71, 1970-71 to 1980-81 and 1980-81 to 1984-85.

Industrial growth performance measured in terms of output and value added lagged behind in U.P. until 1980-81 vis-a-vis the rest. However after 1980-81, U.P. picked up in terms of trend rates of growth of output, which, was more in U.P. than in the rest. By and large, such finding was also reinforced by the average rates of growth. During the period 1980-81 to 1984-85, the output grew at the rate of 21.16 per cent per annum in U.P., which was higher than that in India. (11.91 per cent) and the rest of India (11.28 per cent). Over the longer period (1960-61 - 1984-85), rates of of output were 18.32 per cent in U.P., which was higher than that in India (17.82 per cent) and in rest of India (17.78 per cent). As far as trend rates of growth of value added are concerned, some variations are observed. During two subperiods (1960-61 - 1970-71 and 1970-71 - 1980-81) trend rates growth exceeded in U.P. than that in the rest, during 1980-81 to 1984-85, it was only higher in U.P. than in Indian economy, but lower than the rest of India. Over t.he period as a whole, (1960-61 - 1984-85) performance of the

The regression equations have not been given here due to space constraints.

U.P. was fairly better than the rest. The average rates of growth were also higher in U.P. (12.12 per cent) than that in India (11.70 per cent) and in the rest of India (11.68 per cent) (Table 5).

Such a finding does not get support if industrial development is examined in terms of number of factories. It was found that performance in terms of trend rates of growth as well as in average rates growth of factories was poor in U.P. than in the rest. This was found true for all the subperiods and for the period as a whole.

# V. Relationship Between Industrial Aggregates and Key Factors

Various quantifiable and non-quantifiable factors tend to explain the level of industrialisation, which is an outcome of a complete set of circumstances and the factors 'like geographical conditions, availability of natural and human resources, level of agricultural development, infrastructural facilities, degree of urbanisation, entrepreneurship, etc'.  $^5$  Besides above, the package of policy supports in different forms provided by the government also tend to determine the pace and the pattern of industrialisation. Based on the availability of information in time series, four independent explanatory variables like agricultural development  $(X_1)$ , availability of infrastructural facility  $(X_2)$ , index of urbanisation  $(X_3)$  and policy variable  $(X_4)$  have been selected to explain the

industrialisation ( $Y_1$ ,  $N_1$ , and  $F_1$ ). It may be mentioned that the accurate measurement of policy variable has been a difficult task for researchers. This is so because, policy supports are numerous, which also vary from one time to another. Such a problem is further compounded, when certain policy supports are discontinued, while some new measures are introduced. Therefore, considering the above limitations, dummy has been used as a proxy variable to discern the impact of policy measures. Over the period, 1960-61 to 1968-69 and 1977-78 to 1979-80, 'O' has been used, while 1 for rest of the years. Further 'O' has been used in those specific years in which policy supports were less significant, while '1' in those years in which policy supports were more significant. of dummy 'O' and '1' was determined by considering the per capita expenditure of plan outlay indicated in the Draft Annual Plan of Uttar Pradesh. 6 Thus, multiple regression model in linear and semi-log linear forms have been used to explain the industrialisation. Regression models used in the study are shown here below :

#### A <u>Linear Model</u>

$$Y_1 = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 \dots (1)$$

$$N_1 = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 \dots (2)$$

$$F_1 = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 \dots (3)$$

#### B <u>Semi-Log Linear Model</u>

 $Log Y_1 = a + b_1 Log x_1 + b_2 Log x_2 + b_3 Log x_3 + b_4 x_4 .....(4)$ 

Log 
$$N_1 = a + b_1 \log_{x_1} + b_2 \log_{x_2} + b_3 \log_{x_3} + b_4 + \dots$$
 (5)  
Log  $F_1 = a + b_1 \log_{x_1} + b_2 \log_{x_2} + b_3 \log_{x_3} + b_4 + \dots$  (6)

Where,  $Y_1$ ,  $N_4$  and  $F_1$  are the different indicators of industrialisation like output, Net value added and number of factories, the  $x_1$ ,  $x_2$ ,  $x_3$  and  $x_4$  are the independent explanatory variables like, agricultural development, infrastructural facility, index of urbanisation and policy variable respectively. Further,  $b_1$ ,  $b_2$ ,  $b_3$  and  $b_4$  are parameters to be estimated while a is the constant term.

Results of the multiple regression models (Table 6) are as expected. In case of simple linear model, output as an indicator of industrialisation has been found to be associated positively with the level of agricultural development ( $\beta$  = 0.750) and with the infrastructural facility (B = 0.195). Further, number factories as an indicator of industrialisation is found to be intimately related positively with the infrastructural facility which shows B value of 0.005 at one per cent level of significance. results obtained from the semi-log linear model, by and large, also show the similar trend. Log of output as an indicator of industrialisation has been found associated positively with the urbanisation, agricultural development and the infrastructural facility. Log of net value added and the number of factories as indicators of industrialisation are found positively associated only with infrastructure. Unfortunately, the impact of policy variable has not been found significant statistically. Thus considering

overall results, it becomes crystly clear that pace and pattern of industrialisation in U.P. is the mainly the outcome of agricultural development followed by infrastructure and the level of urbanisation.

#### V. Concluding Remarks

U.P. was poor as compared to India and the rest of India in terms of total NDP and NDP from the tertiary sector. Growth rates of NDP from primary sector stgnated in U.P., while significant performance was seen in India and rest of India. In contrast to above, the growth of NDP from the secondary sector was fairly satisfactory in U.P. than in the rest, which showed poor rates of growth than that in U.P. This was found primarily due to rates of growth witnessed by secondary sub-sectors like registered manufacturing, un-registered manufacturing and the construction, electricity, gas, etc. This, in turn may also be outcome of the pace and pattern of industrialisation.

Exercise was further extended to examine the growth performance of various indicators of industrialisation. Rates of growth of output and net value added were found higher in U.P. than that of the rest. Such a finding confirmed that U.P. experienced a higher rates of industrialisation than that of the rest. It posed an important question as to what factors are responsible for this observed phenomenon. Multiple regression models used in

different forms, revealed that industrialisation in the state is mainly the outcome of agricultural development, infrastructure facility and the urbanisation. Thus, in order to speed up the pace of industrialisation in the state, a concerted efforts are required to be made to enhance the level of agricultural development, to enlarge the infrastructural facility and to intensify the urbanisation programmes. This would ultimately serve as pre-requisites for industrialisation, which over time might help in achieving the broad social objectives of productive employment generation and poverty removal.

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Table 1: Sectoral Share of U.P. in National Economy, 1960-61 - 1985-86 at 1970-71 Prices

(in per cent)

Year	Share of U.P. in National NDP	Share of U.P. in Country's Primay Sector	Share of U.P. in Country's Secondary Sector	Share of U.P. in Country's Tertiary Sector
1960-61	13.63	15.82	8.51	12.25
1961-62		15.52	8.96	11.82
1962-63	12.97	15.17	9.17	11.33
1963-64	12.01	13.89	8.95	10.68
1964-65	12.84	15.31	9.20	10.76
1965-66		16.41	9.50	10.62
1966-67	11.77	14.24	8.55	10.22
1967-68	하는 사람들이 가는 사람들이 되었다. 그렇게 되었다면 하는 것이 없는 것이다.	15.06	7.85	10.21
1968-69	11.79	14.60	7.75	10.00
1969-70	병교들은 이 경기 아이들은 사람이 되었습니다. 그런 원생들은 사용하는 것은 사람들이 있다.	15.18	8.33	10.04
1970-71	12.33	14.82	9.35	10.13
1971-72		13.50	8.93	9.88
1972-73	12.32	15.32	9.27	7.76
1973-74	11.19	13.25	9.04	9.49
1974-75		14.50	8.45	9.32
1975-76	11.42	13.98	8.70	9.19
1976-77		15.13	8.79	9.10
1977-78	그리는 기원이 소설을 하는 일본 경우를 하고 말했다. 그는 나는 없었다.	14.72	9,27	9.04
1978=79	11.50	14,46	9.50	8,72
1979-80	10.47	12.41	10.08	8.57
1980-81	12.03	15.43	10.91	8.69
1981-82	나는 사람들이 가는 것 같아. 그는 나는 것은 사람들은 사람들이 되었습니다. 그는 사람들이 가지 않는 것이 없었다.	14.76	10.60 '	8.56
1982-83	12.43	16.10	12.51	8.64
1983-84	보고 사람이 하면 하고 나무를 하셨습니까 이 모든데 보면 하는데 하는데 모든데 하고 있어요?	15.36	12,69	8.58
1984-85	12.14	1565	12.83	8.34
1985-86		15.84	12.77	8.21

Source: C.S.O., Government of India, Statistical Abstract, Various Issues; Government of U.P., Planning Department, Eighth Five Year Plan (1990-95) and Annual Plan, 1991-92, Vol.1

Table 2: Annual Average Rates of Growth of NDP from Different Sectors in India, over Different Periods at 1970-71 Prices

perlua,	Different Section Prices Periods at 1970-71 Prices			(in per cent)		
Gib-sectors	1960-61 to 1970-71	1970-71 to 1980-81	1980-81 to 1985-86	1960-61. to 1985-86		
1. Net Domestic Product at	3.79	3.37	4.66	5.74		
1. Factor Cost	2,31	1.51	2.20	2.52		
2. Primary Sector	2.22	1.51	2.08	2,43		
2.1 Agriculture	4.16	1.54	4.23	4.37		
2.2 Others		4.15	5.06	8.13		
3. Secondary Sector	5.83 6.52	4.55	7.05	10.25		
o 1 Registered Manufacturing		4.48	3.39	5.84		
3.2 Un-registered Manufacturin	7.09	3.35	3.63	7.55		
3.3 Others		5.96	7.30	11.01		
4. Tertiary Sector	5.66 5.95	_ "_	5.72	7.85		
4.1 Transport, Communication and Trade	5.85	4.71	- 5, 08	, 8.6		
4.2 Hotels and Restaurants	3,8		1 .17.6	1 23.1		
4.3 Others				from H.		

Source.: Datea on above respects have been collected from H.L. Chandhok and Policy Group, <u>India's Data Base</u>, Vol.I & Clandhok and Policy Group, India's Data Base, Vol.I & II, New Delhi, 1990

Table 3: Annual Average Rates of Growth of NDP from Different Sectors in Rest of India, over Different Periods at 1970-71 Prices

(in per cent) Private Addition 1960-61 1980-81 1970-71 1960-61 to Sectors and Sub-sectors to to to 1985-86 1985-86 1980-81 1970-71 5.89 1. Net Domestic Product at 4.65 3.42 3.98 Factor Cost 2.52 2.11 1.44 2.45 2. Primary Sector 2.42 1.98 1.42 2.37 2.1 Agriculture 4.27 4.05 1.68 3.93 2.2 Others 7.57 4.60 3.92 5.69 3. Secondary Sector 9.94 6.58 4.63 6.39 3.1 Registered Manufacturing 4.96 2.22 4.02 3.64 3.2 Un-registered Manufacturing 6.81 3.54 2.83 6.75 3.3 Others 11.69 7.43 16.31 6.01 4. Tertiary Sector 13.45.4 9.87 4.1 Transport, Communication 5.71 5.45 6.01 and Trade 9.15 4.83 4.92 6.36 4.2 Hotels and Restaurants 39.40 22.38 20.64 4.25 4.3 Others

Source : As per table 2

Table 4: Annual Average Rates of Growth of NDP from Different Sectors in U. P., over Different Periods at 1970-71 Prices

Sectors and Sub-sectors	1960-61 to 1970-71	1970-7.1 to 1980-81	1980-81 to 1985-86	1960-61 to 1985-86
1. Net Domestic Product at	2.56	3.07	4.70	4.61
Factor Cost	1.60	1.95	2.70	2.53
2. Primary Sector	1.48	z.01	2.60	2.47
2.1 Agriculture	7.23	-0.12	6.62	5.68
2.2 Others		6.36	8.74	14.13
3. Secondary Sector	7.31 8.62		14.46	15.38
3.1 Registered Manufacturing			10.58	13.14
3.2 Un-registered Manufactur	10.14		4.08	14.2
3.3 Others 4. Tertiary Sector	3.11	3.82	5.97	6.1
4. 1 Transport, Communication	n 4.3	1 6.49	5.90	9.3
and ITSUS	2.3		7.70	j 5."
4.2 Hotels and Restaurants	3,3		2 4.7	7 5.0

Source : As per table 2

Table 5 : Annual Average Rates of Growth of Output, Net Value Added and Factories in India, Rest of India and U.P. Over Different Periods

As Ditter			(in per cent)		
Industrial Aggregates/ Regions	1960-61 to 1970-71	1970-71 to 1980-81	1980-81 to 1985-86	1960–61 to 1985–86	
A. <u>Output</u>	7.67	7.77	11.91	17,82	
ų. India	9.05	6.77	11.28	17.78	
2. Rest of India	7.80	4,18	21.16	18.32	
3. U.P.					
B. <u>Net Value Added</u>	6.03	5.19	4.57	11.70	
1. India	7.12	4.24	9.97	11.68	
2. Rest of India	7.83	3.53	11.19	12.12	
3. U.P.					
C. <u>Factories</u>	4,62	4.56	15.67	40.5	
1. India	6.52	3.78	107.53		
2. Rest of India	3.56	3.49	. 3,45	5.1	
3. U.P.			= 400		

Output = Rs. crores at 1970-71 = 100

Net value added = Rs. crores at 1970-71 = 100

Factories = '000 Nos.

Source : As per table 2

Table 6: Determination of Industrialisation in U.P., 1960-61 - 1985-86

			Regression C	oefficient	of			
Dependent Variables		Agrl. Deve- lopment (X <sub>1</sub> )	ctural Urbani- Facilty sation	Urbani-	Policy Variable	R <sup>c</sup> Values		D.F. Values
				(X <sub>4</sub> )				
A. Linear h	<u>lodel</u>							
Y <sub>1</sub> = -2	1.317	0.750** (2.058)	0.195** (2.405)	0.173 (0.178)	3.765 (0.445)	0.96*	126.00	21.00
N <sub>1</sub> = -22°	7.729	0.152 (0.142)	-0.127 (-0.534)	3.390 (1.181)	7.731 (0.311)	0.46*	4.47	21.00
F <sub>1</sub> = '	1.133	-0.079 (-0.200)	0.005* (2.906)	-0.008 (-0.387)		0.92*	60.38	21 <b>.0</b> 0
B. <u>Semi-Loc</u>	<u>Linear Mo</u>	<u>idel</u>						
Log Y <sub>1</sub> = -	2.627	0.484** (2.218)	0.269* (3.154)	0.796** (1.826)	0.029 (0.488)		126.00	21.00
Log N <sub>1</sub> =	7.695	-0.260 (-0.305)	0.612** (1.836)	-1.111 (-0.653)	0.072 (0.315)	0.39**	3.36	21.00
Log F <sub>1</sub> =	0.752	-0.068 (-0.885)	0.327* (10.811)	-0.197 · (-1.268)		0.78*	257.27	21 <b>.0</b> 0

#### Where,

 $Y_1$  = Indices of output in Rs. crores at 1970-71 = 100

 $N_1$  = Indices of net value added in Rs. crores at 1970-71 = 100

 $F_4$  = Factories in '000 numbers

X<sub>1</sub> = Agricultural development expressed in foodgrains production in crores tonnes

X<sub>2</sub> = Availability of infrastructural facility expressed in motor vehicles in '000 numbers

 $X_3$  = Index of urbanisation at 1970-71 = 100

 $X_4$  = Dummy variable '0' during 1960-61 to 1968-69 and 1977-78 to 1979-80 while '1' for the remaining years.

Figures under parenthesis show 't' values

\* Indicates significant at 1 per cent level \*\* Indicates significant at 5 per cent level

Source : Data has been collected from H.L. Chandhok and Policy Group, <u>India's Data Base</u>, Vol.I & II, New Delhi, 1990

# SOURCES OF REGIONAL DISPARITIES IN RURAL INFRASTRUCTURE IN PUNJAB

R.S. Bawa\* Anjali Mehra\*\*

### <u>Introduction</u>

In the less developed countries where around 75 per cent of the population lives in rural areas, it is impossible to take giant leap forward unless and untill the rural economy also surges ahead. The generation and sustenance of economic growth especially in the early stages in most developing countries are to a large extent determined by the performance of the rural sector. A rural sector unresponsive to stimuli or unstable in nature may substantially impede steady growth of the economy. Therefore, this less developed countries have to give high priority to rural development.

Rural development is concerned with the improvement in the living standards of the low income population living in rural areas on a self-sustaining basis through transforming the socio-spatial structure of their productive activities. Rural development has emerged as a strategy designed to improve the economic and social life of a specific group of people i.e. the rural poor. It involves extending benefits of development to the poorest among these who seek a livelihood in the rural areas. 3

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Rural development is not exclusively determined by the economic behaviour of the farmers, rather it is determined by the 'economising setting' in which they operate. This economizing setting is made up of components which are physical climatic, socio-cultural and institutional in nature. Some of these components which can be provided by the state, like institutional factors, are referred to as infrastructure. These components are required to break the chain of causation of under-development and set in motion a self-sustaining development process.

It has also been observed that in spite of the same level of state effort to provide a uniform initial level of infrastructure there has been large disparities among different regions in respect of the growth of these infrastructural facilities. As there is a growing awareness among countries for a balanced regional development and hence towards decentralised planning, it is imperative to study regional disparities in availability and growth of infrastructure.

Punjab though densely populated and predominantly agricultural has a generally developed infrastructure and social services. Yet, the state is marked by considerable regional and inter-district variations in overall development as well as in rural development. These disparities in rural development can be attributed mainly to along with some other factors, the availability and growth of rural infrastructure. Analysis of causes for such variations in rural infrastructure assume special significance because once

identified the factors responsible for such disparities can be tackled through economic planning. Thus leading to a balanced and more equitable development scenario.

It is in this context that the present exercise has been carried out to examine the factors affecting regional variations in rural infrastructure in Punjab.

For the present study districts have been considered as regions for the reason of availability of data as also being a homogenous administrative unit. Data have been collected from various issues of Statistical Abstracts of Punjab.

The following variables have been considered as the possible indicators of rural infrastructure. The choice of variables have been, to some extent, restricted by the availability of data.

- X<sub>1</sub> Irrigation intensity
- X<sub>2</sub> Net area irrigated per thousand hectares of net area sown
- X<sub>3</sub> Consumption of electric power per thousand hectares of gross cropped area
- X4 Number of regulated market per thousand hectares of gross cropped area
- X<sub>5</sub> Number of sub-yards attached per regulated market per thousand hectares of gross cropped area
- X6 Area served per regulated market per thousand of gross cropped area
- X7 Number of villages served per regulated market per thousand of gross cropped area
- X8 Number of post offices per thousand of population
- Xq Number of veterniary institutions per thousand of population

- X10 Number of commercial banks per thousand of population
- X<sub>11</sub> Members of co-operative society per thousand of population
- X<sub>42</sub> Percentage of villages linked with Pucca roads
- $\chi_{4R}$  Number of primary schools per thousand of population
- X<sub>14</sub> Number of middle schools per thousand of population
- X<sub>15</sub> Number of high/higher secondary schools per thousand of population
- X<sub>16</sub> Number of medical institutions per thousand of population
- X<sub>47</sub> Number of medical institutions per village

The data on these variables for all the districts been obtained for the year 1975-76 to 1985-86. The technique of factor analysis has been employed to identify factors complementary variables responsible groups of for interdistrict variations in these variables. The factor analysis has been applied at three points of time 1976-77, 1980-81 and 1985-86. As there are only 12 districts in the state, therefore, to get reasonable number observations at each point of time, three consecutive years with the reference year in the middle have been used for factor analysis. For analysis at 1976-77, 36 observations for 1975-76, 1976-77 and 1977-78 have been used. Similarly, for 1980-81, the observations for 1979-80, 1980-81 and 1981-82 and finally for 1985-86, the observations for 1984-85, 1985-86 and 1986-87 have been used. The results of analysis are discussed below:

#### RESULTS AND DISCUSSION

#### I. <u>Relative Level of Development of Infrastructure</u> <u>for 1986-87</u>

The level of infrastructural development in districts, as measured by different indicators, is examined through Table 1. If we compare the position of districts with regard to infrastructural indicators, we find that there exist wide disparities among them. In case of irrigation intensity, Ludhiana, Sangrur and Amritsar are way ahead of Hoshiarpur and Rupnagar. For net area irrigated to net area sown, Amritsar's (997.03) position was much ahead as against Hoshiarpur (533.73) and Rupnagar (656.35). In consumption of power per thousand of gross cropped area. Jalandhar was at the top while Bathinda was at bottom. case of number of regulated markets per thousand hectares of goods cropped area, Jalandhar (.0257) was at the top, while Faridkot (.0126) was way behind. For number of subyards attached per regulated markets per thousand hectares of gross cropped area, the least value was of Bathinda (.043) while maximum was in case of Gurdaspur (.1106). Similarly, for area served and number of villages served per regulated market per thousand hectares of gross cropped area, minimum value was of Sangrur, while maximum was of Rupnagar. In case of number of post offices per thousand of population, we find Jalandhar (.378) ranking first while Bathinda (.177) ranked In case of number of veterinary institutions per thousand of livestock population, we find Rupnagar (.263)

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having maximum values as against Ferozepur (.125) which the least value. In case of number commercial banks serving per thousand of population, Amritsar (.119) ranked first compared to Faridkot (.067) and Gurdaspur (.068) which lag behind. For number of members of co-operative society thousand of population maximum number of members are served in the district of Ludhiana while minimum number is served in Gurdaspur (76) and Ferozepur (81). Less variations are found in case of percentage of villages linked with pucca roads. districts of Faridkot, Bathinda, Sangrur, Jalandhar, Gurdaspur have 100 per cent villages linked, while Ferozepur (83.3z) and Amritsar (87.6) have the lowest percentage of villages linked with roads. In case of number of primary schools per thousand of population, Rupnagar and Hoshiarpur have maximum values, while manimum is that of Bathinda. Similarly, for number of middle schools per thousand of population, higher number is in case of Ludhiana (.300) and Kapurthala (.303) and lower are for Gurdaspur (.199) and Ferozepur (2.11). In case of number of high/higher secondary schools, Jalandhar ranked first as against Ferozepur, which ranked last. In case of medical institutions per thousand of population, Kapurthala .359) came first while Gurdaspur (.176) was last. For number of medical institutions per village Faridkot (.291) had maximum value while Gurdaspur (.110) had the least.

It may be seen from Table 2 that coefficient of variations in most of indicators of rural infrastructure

showed decline at a significant rate during 1976-77 to 1985-86. Only in case of area served per regulated market and number of villages served per regulated market the interdistrict disparities increased at a significant rate.

#### II. Sources of Inter-District Variations

The results of factor analysis applied at three points of time namely 1976-77, 1980-81 and 1985-86 are presented in Table I, Table II and Table III respectively.

As can be seen from Table III, the first factor consisted of the variables having highest positive factor loading with  $F_1$ . These variables are irrigation intensity, number of commercial banks, number of medical institutions and net area irrigated. This factor thus represents agricultural, health and financial infrastructure. This factor accounted for 44.87 per cent variations per cent in the variable set and was thus very important factor in explaining the variations in 1976-77.

Factor 2 consisted of co-operative societies; mumber of high and higher secondary schools, number of veternary institutions and percentage of villages linked with puccaroads. This variable, therefore, represents co-operative credit, animal health and roads. It explained 16.92 per cent of the total variations in the variable set.

Factor 3 and Factor 4 explained only 12.56 and 10.18 per cent of the total variations. Factor 3 consisted of number of markets and subyards attached to them, and consumption of

electric power. Thus this factor represented the marketing and power variables. Similarly factor 4 represented number of medical institutions and the villages and population served per market.

The results for 1980-81 shown in Table IV show that Factor I consisted of Irrigation Intensity and area served per regulated market. This factor accounted for 41.79 per cent of total variation. Factor 2 consisted of variables representing post offices, banks, agricultural markets and consumption of electricity. This represented the State contribution to the infrastructure and accounted for only 14.3 per cent of total variations. Factor 3 consisted of roads, medical institutions and education along with cooperative societies. Factor 4 mainly consisted of medical institutions and middle school. This may be called basic needs of the rural people and accounted for only 10.33 per cent of the total variation.

The Factor analysis of 1985-86 data showed (Table V) that irrigation intensity and medical institutions were most important factor accounting for 33.13 per cent of total variations. This was closely followed by Factor 2 contributing 22.28 per cent of total variation and consisting of basically education and regulated market variables alongwith co-operative societies. Factor 3 and 4 contributed 16.12 and 10.09 per cent to the total variations. This factor consisted of Post Offices, banks, medical

institutions, irrigation and electricity consumption in the third factor, and number of veterinary institutions and primary schools in the fourth factor.

The above results of factor analysis applied on 1976-77, 1980-81 and 1985-86 data show that over a period of ten years since 1976-77, the importance of different variables in explaining inter district variations in rural infrastructure has changed. The analysis further shows that irrigation intensity continued to be the most important variable in explaining inter district variations during all the periods alongwith number of medical institutions per village.

The next most important variables seem to be education, roads and markets. These are followed by post offices, commercial banks and veternary institutions alongwith cooperative societies.

The analysis thus shows that even in a state like Punjab which is considered to be most prosperous among Indian states (based on per capita income) and which has relatively equitable distribution of incomes, the availability of rural infrastructure is quite unequitable among districts. This can be one of the major causes of inter district variations in Agricultural development as well as general economic development. It may be added that a developed rural infrastructure can go a long way in rural industrialisation and hence in more equitable distribution of gains of economic development among rural and urban areas as well as among various regions of the State.

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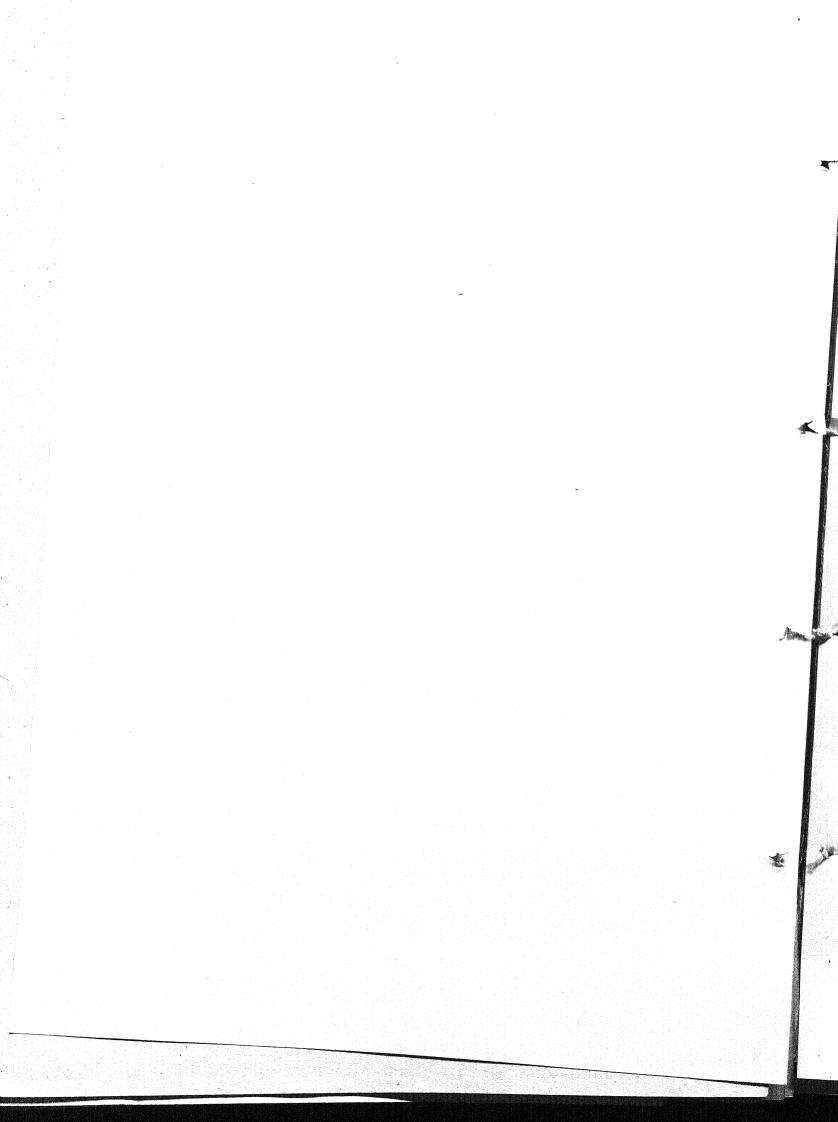
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TABLE-III

Determinants of Rural Infrastructure 1976-77

Unrotated Factor Matrix

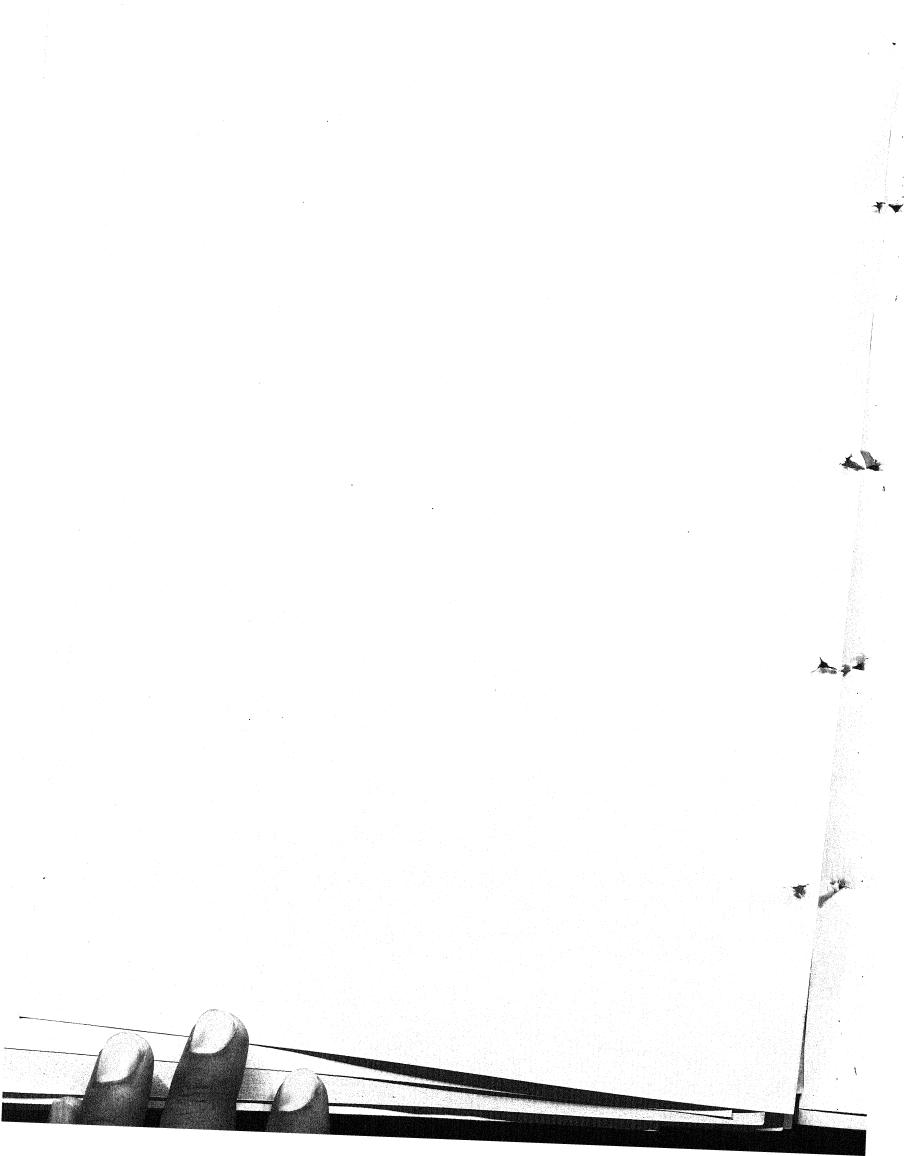
Variable	FACTOR LOADINGS					
	Factor	L Factor 2	Factor 3	Factor 4		
Irrigation Intensity	.6 176	.3772	<b>.</b> 5903	.1371		
Number of Commercial banks per thousand of population.	. 86 46	.4431	.0147	155		
Number of medical institutions per village.	.6 387	.4753	4370	.1316		
Net Area irrigated per thousand of net area sown.	.7209	.2832	<b>.</b> 4805	.2579		
Number of Cooperative Societies per thousand of population.	<b></b> 7649	.4494	<b>-</b> 2677	.0663		
Number of high/higher second- ary schools per thousand of population.	8183	.2338	2260	.1302		
Number of Veternary institution per thousand of population.	s-  <sub>1</sub> ,3505	.8551	-1,0374	07 36		
Percentage of villages linked with pucca roads.	. 3337	.9062	<b>40282</b>	.0067		
Number of middle schools per thousand of population.	5385	.4518	1552	2350		
No. of Regulated markets per thousand of Gross Cropped areas.	7360	.1589	.5535	•0011		
Subyards attached per regulated market per thousand of gross cropped area.	<b></b> 7229	.0496	. 37 90	4769		
Number of primary schools per thousand of population,	8036	2242	.0235	1479		
Consumption of electric power per thousand of gross cropped area.	4895	0726	.8260	.0164		
Number of Post offices per thousand of population.	7543	0482	0059	.1285		
Area served per regulated market per thousand of gross cropped area.	<b>-</b> 1.7235	1921	2168	.5942		
No. of villages served per regulated markets per thousand of gross cropped area.	<b>-</b> 1₀8622	2798	0515	.3538		
Number of medical institutions per thousand of population.	0840	2173	,2026	.8880		
Percentage of variance explained.	44,87	16.92	12.56	10.18		



### TABLE\_IV

Determinants of Rural Infrastructural (1980-81) Unrotated Factor Matrix

	ر سن من سن من (مند) لند و لغة و منا و علم و الله						
*:	Variable	Factor 1		FACTOR LOADING Factor 2 Factor 3 Factor			
			9 9 9 9	, -, -, -, -,			
	Irrigation Intensity	6890	.6100	0719	.2983		
	Area served per regulated market per thousand of gross cropped area.	.8472	3888	<sub>•</sub> 0326	. L 39O		
	Number of post offices per thousand of population.	<b>-</b> 46858	.2501	1617	.2121		
	Number of veterinary institu- tions per thousand of live- stock population.	5501	.3565	.3369	5471		
	Number of commercial banks per thousand population.	6 345	.5242	.1988	1855		
	Number of regulated markets per thousand of gross cropped area.	<b></b> 7688	.3111	0829	<b>-</b> ₹0428		
	Number of subyard attached per regulated market per thousand of gross cropped area	<b></b> 7540	.3022	1931	4177		
	Net area irrigated per thousand of net area sown.	.3172	.6788	3331	2690		
•	Consumption of electric power per thousand of gross cropped area.	1420	,6542	-i <sub>a</sub> 4209	•4429		
	Number of cooperations societies per thousand of population.	6531	.0814	.3543	1832		
	Number of villages served per regulated market per thousand of gross cropped area.	9340	2913	.07 39	.0461		
	Number of high/higher sec; schools per thousand of population.	6296	.2025	·•4843	.16 14		
	Percentage of villages linked with pucca road.	1863	.0320	<b>,</b> 77 57	.0944		
	Number of medical institutions per willage.	.6336	.1671	.66 16	<b>-</b> ₩0988		
	Number of primary schools per thousand of population.	- <sub>1</sub> 8092	3692	<b></b> 37 48	.0443		
	Number of middle schools per thousand of population.	8176	.2278	0216	.4832		
	Number of medical institutions per thousand of population.	. <b></b> 0341	.0907	.4135	.7119		
	Percentage of variance explained.	41.791	14.3	13.14	10.33		



## TABLE-IN

Daterminants of Rural Infrastructure (1985-86) Unrotated Factor Matrix

Variable	FACTOR LOADING					
ر من المنظم المنظم المنظم المنظم	Factor 1	Factor 2	Factor 3	Factor 4		
Irrigation Intensity	.7611	0348	.4681	.1170		
Number of medical institution per village.	ons6648	.6413	· <b>.</b> 1366	.0597		
Number of villages served per regulated market per thousand gross cropped area.	er7310 ′ nd	56 12	<b></b> 0490	.2504		
Percentage of villages linke with pucca road.	ed2551	.5241	2004	4185		
Number of middle schools per thousand of population.	0480	.9011	2311	.1549		
Number of high/higher school per thousand of population.	ls1935	.87 27	. 3481	0545		
Members of cooperative societies per thousand of population.	-:2090	.3207	.2846	8015		
Area served per regulated market per thousand of gross cropped area.	<b></b> 8506	.1060	0845	.0507		
Number of regulated markets thousand of gross cropped area.	per6901	2204	.2559	1207		
Number of subyard attached per regulated market per thousand gross cropped area	<b></b> 8558	0%4	.3284	.2403		
Number of post offices per thousand of population,	5432	. 1571	6282	2364		
Number of commercial banks per thousand of population	.3615	,4642	. 6602	2020		
Number of medical institution per thousand of population.	ons 1897	1, 28 35	.6 313	. 2148		
Net area irrigated per thousand of net area sown.	, 3884	-, 326 5	.6 386	.4555		
Consumption of electric power per thousand of gross croppe area.		<b></b> 4829	.5813	2162		
Number of Veterinary institutions per thousand of livestock population.	<b>-</b> 1₀6239	i <sub>•</sub> 0437	1,1982	:.5411		
Number of primary schools per thousand of population.	-1,7289	6128	1051	.1561		
Percentage of variance explained.	31,13	22.28	16.12	±0.09		



## REGIONAL DISPARITIES IN AGRICULTURAL AND INDUSTRIAL DEVELOPMENT IN INDIA

Dr.Hem Chandra Lal Das\*

About 60 per cent of the total working force in India is in the agricultural sector, contributing only about engaged 35 per cent of the national income. This reflects the existence of acute poverty in this sector. The existence of: highly inequitable distribution on land-water resources among the cultivators leads to wide disparities in their farm The uneven distribution of benefits following new agricultural technology and other institutional has contributed to the inter and intra regional changes which need to be minimised in the greater disparities interest of the society. Similarly, the industrial sector which possesses a higher marginal propensity to save and invest, contributes significantly to the eventual achievement of self-sustaining economy with continued high levels of investment and rapid rate of increase in income and industrial employment. Thus, industrialisation acts as an instrument both of creating capacity to absorb excess power and of creating oportunities for the diversification of the market required at higher stages of economic development. Just as there exists inter and intra regional disparities in agricultural development in our country, similarly there

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exists inter and intra regional disparities in industrial development.

In the development of an under-developed economy like India, there is no conflict between agricultural and industrial development. The fact that the productivity of labour in industry is higher than that in agriculture, points to the need for rapid industrial development, and the development process in India reveals that there most of the path-breaking industrial development has taken place in the states which have done well in agriculture. Moreover, in under-developed economy, the surplus created in industrial sector is more likely to be available for investment more easily than that in the agricultural sector. There is felt need of agri-industrial development for reducing the inter and intra regional imbalances.

In the present paper an attempt has been made to throw light on the regional disparities by measuring the levels of agricultural and industrial development in the major states in India and to suggest measures to reduce the regional disparities.

### Methodology

In the present study of levels of agricultural and industrial development or backwardness of various states, the composite indices of agricultural and industrial development have been calculated with the help of available data to

assess the state-wise pattern of agricultural and industrial development. Comparison of economic development of various states and state-wise disparities involve the selection of suitable indicators of development and suitable method of combining data for several indicators if more than one indicators of development are selected. As all the indicators of development are not equally important, hence different weights have been assigned to different indicators by method of 'Per cent Proportional Standardised Mean'. That is to say, the weight assigned to one indicator is calculated

by finding out ———— of the series, where  $\overline{X}$  is the average  $\overline{S}$ 

of the series and S is the standard deviation of the same  $\overline{\mathbf{x}}$ 

series. The ---- is the weight of any indicator. 1

C.I.A.D. 
$$x_1$$
.  $x_2$ .  $x_2$ .  $x_2$ .  $x_3$ .  $x_4$ .  $x_5$ .  $x_6$ .  $x_7$ .  $x_8$ .

where C.I.A.D. = Composite index of agriculture development C.I.I.D. = Composite index of industrial development  $X_1 \dots X_n$  = Indicators of agricultural/industrial development

 $X_1 ext{ ... } X_n = Arithmatic mean of different indicators, <math>S_1 ext{ ... } S_n = Standard deviation of different indicators}$ 

The following indicators have been selecged for the construction of the composite index of agricultural development:

- 1. Crop intensity for 1960-61, 1970-71 and 1980-81;
- 2. Irrigation intensity for 1960-61, 1970-71 and 1980-81;
- 3. Per agricultural worker availability of net area sown (1960-61, 1970-71 and 1980-81);
- 4. Share of commercial crops in gross cropped area for 1960-61, 1970-71 and 1980-81; and
- 5. Per hectare productivity of principal crops for 1960-61, 1970-71 and 1980-81.

Similarly, the composite index of industrial development has been computed by using the above mentioned formula on the basis of the following indicators:

- 1. Per capita net domestic product for 1961, 1971 and 1981;
- Per capita ex-factory value of output for 1961, 1971 and 1981;
- Per capita value added by manufacture for 1961, 1971 and 1981;
- 4. Per capita productive capital for 1961, 1971 and 1981;
- 5. Factory employment per 1000 of population for 1961, 1971 and 1981.

The spatial differentials in the indicators of agricultural and industrial development have been calculated on the basis of williamson's formula  $^2$ :

where Vw = Weighted coefficient of regional disparity;

Yi = Per capital values of respective indicators of agricultural or industrial development of the ith region;

Y = Per capita values of respective indicators of agricultural or industrial development at the national level:

Pi = Population of the ith region;

P = Population at the national level

Spatial differentials have been measured in relative and not in absolute terms, the indicators of agricultural/industrial development have been taken as per cent of their respective national figures. This formula has been used by Srivastava,  $^3$  Das,  $^{4-5}$  and Tiwari and Nar Singh.  $^6$ 

The relevant data on agricultural development have been taken from the various issues of the <u>Estimates of Area</u>, <u>Production and Yield of Principal Crops in India</u>, and those on industrial development from the <u>Report of Annual Survey of Industries</u> (1961, 1971 and 1981).

#### Pattern of Agricultural Development in India

The weights assigned to the different selected indicators have been presented in the Table 1 which reveals that crop intensity has got the highest weight for all the three years under consideration, followed by irrigation intensity. Per agricultural worker availability of net sown area i.e. land — man ratio has got the lowest weight in 1960—61 and 1970—71, but in 1980—81 the lowest weight has been observed with the per hectare productivity of principal crops.

Table 1: <u>Distribution of Weights Among Selected Indicators</u>
<u>of Agricultural and Industrial Development</u>

	마이크로 하는 경우 이 경우 보이고 있다고 있다. 그런 10 - 12 - 12 - 12 - 12 - 12 - 12 - 12 -	Percentage of Weig		Weights
		1960-61	1970-71	1980-8
	ndicators of Agricultural evelopment			Annual Control of the
1	. Crop intensity	39.60	36.03	37.17
2	. Irrigation intensity	27.86	29.57	27.22
3	. Per agricultural worker availability of net area sown		9.38	10.83
4	. Area under commercial crops	8.94	9.96	13.46
5	. Per hectare productivity	14.84	15.06	9.30
	Total W	100.00	100.00	100.00
	ndicators of Industrial evelopment			PROMOTOR AND AN ANALYSIS OF THE PROPERTY OF TH
	. Per capita net domestic product	52.40	40.56	32.80
#	. Per capita ex-factory value of output	11.27	13.05	13.94
2	Per capita value added by manufacture	10.79	13.05	14,14
4,	. Per capita productive capital	12.91	18.12	20.04
5.	Factory employment per 1000 of population	12.63	15.22	17.08
	Total W	100.00	100.00	100.00

In the industrial sector, per capita net domestic product got the highest weight for all the three years under

consideration, followed by per capita productive capital and factory employment per 1000 of population. However, the significance of per capita net domestic product has been found declining from 52.40 per cent in 1961 to 40.96 per cent in 1971 and to 32.80 per cent in 1981, while the significances of other indicators have been found increasing.

On the basis of the indicators of agricultural development, the composite index of agricultural development (C.I.A.D.) has been constructed for major 15 states for 1960-61, 1970-71 and 1980-81 and the result has been presented in the Table 2.

Table 2 reveals that in 1960-61, Tamil Nadu had got the highest index of agricultural development (131.77) followed by Gujarat (131.33) and Punjab (125.02). The lowest index of agricultural development has been seen with Orissa (75.4) followed by Bihar (81.13) and West Bengal (86.15).

In 1970-71, the highest per cent index of agricultural development has been observed in Punjab (135.42) followed by Gujarat (130.23) and Tamil Nadu (115.45), while the lowest index has been found in Madhya Fradesh (74.47) followed by Assam (83.53) and Bihar (83.78).

In 1980-81, Karnataka has been observed with the highest index of agricultural development (129.32), forlowed by Gujarat (123.19) and Kerala (116.02), while the lowest index has been found with Bihar (51.84) followed by Madhya Pradesh (59.93) and Uttar Pradesh (70.99).

## Pattern of Industrial Development in India

The regional distribution of composite index of industrial development has been presented in the Table 3 which reveals that in 1961 Maharashtra had got the highest per cent index of industrialisation (147.37) followed by West Bengal (146.70) and Gujarat (124.72). The lowest index of industrial development has been seen with Bihar (70.47) followed by Orissa (75.93) and Uttar Pradesh (76.19).

In 1971, the highest per cent index of industrialisation has been observed with Punjab (131.75) followed by Maharashtra (123.70) and West Bengal; (119.20), while the lowest index of industrialisation has been found with Haryana (51.20) followed by Bihar and Jammu and Kashmir (61.35).

In 1981, Maharashtra has been observed with the highest index of industrialisation (155.96) followed by Punjab (145.55) and Haryana (137.09). The lowest index of industrialisation has been observed with Bihar (53.47) followed by Madhya Pradesh (63.67) and Assam (64.43).

In 1981, Punjab, Haryana and Gujarat have the higher indices of industrialisation while Bihar, Madhya Pradesh, Assam, Orissa and Uttar Pradesh have the lower indices of industrial development.

## <u> Agriculture - Industry Inter Relationship</u>

What is significant in the regional pattern of industrial development in India, is that most of the path-

breaking industrial development has taken place in the states which have done well in agriculture. Agriculture being the back-bone, the north-west part of India has the strong base to support the fast growing industrial sector with vast consuming centres. This is only to expand further and faster in the coming years. The easy availability of the technical manpower, a reasonably supply of power, market accessibility and transport system in the north-west is poised to take leap in industry.

Table 4: Regional Distribution of composite Indices of Agricultural and Industrial Development in India (1980-81)

State	Composite Index of agricultural development	Rank	Composit Index of industrial development	Rank
Andhra Pradesh	108.93		75.71	8
Assam	78.94	12	64.43	13
Bihar *-	51.84	15	53.47	15
Gujarat	123.19	2	130.95	4
Haryana	102.27	6	137.09	3
Karnataka	129.32	1	76.10	7
Kerala	116.02	3	71.29	10
Madhya Pradesh	59.93	14	63.67	14
Maharashtra	101.25	7	155.96	1
Drissa	88.82	10	66.32	122
Punjab	100.42	8	145.55	2
Rajasthan	92.84	9	68.91	11
Tamil Nadu 🦾	110.43	4	83.44	6
Uttar Pradesh	70.99	13	72,57	. 9
West Bengal	81.52	11	85.48	5

Spearman's rank correlation coefficient = +0.57 (Significant at 0.05 level)

As revealed from the Table 3. Punjab, Haryana.

Maharashtra and Gujarat stand out as leaders in industrial

development. Simultaneously, these states are the leaders in agricultural development also. With a view to analyse the inter-relationship between agriculture and industry, the rank correlation coefficient (of Spearman) between the levels of agricultural development and industrial development of the major states has been computed (Table 4), which has been found +0.57 (significant at 0.05 level).

# <u>Regional Disparities in Agricultural and Industrial Development</u>

of the objectives of planned development in India been the reduction in the imbalances in respect has economic development. The weighted coefficient of disparity in the agricultural and industrial development with respect to the selected indicators have been given Tabled Ξ. The Table 5 reveals an increasing trend in the disparity in almost all the indicators Of. agricultural development between 1960-61 and 1980-81, except irrigation and area under commercial crops which have shown a decreasing trend. The disparity in the composite index of agricultural development has been observed with an increasing trend between the two points of time under consideration.

But in the industrial sector, the trend in regional disparity has been found decreasing. The weighted coefficient of regional disparity in industrial development has been found decreasing from 6.7433 in 1961 to 6.4622 in 1971 and to 5.7775 in 1981. The decreasing trend in the

Table 5 : Williamson's Coefficient of Regional Disparities in Agricultural and Industrial Development in India

	Coefficient of Region Disparities		ional
	1960-61	1970-71	1980-81
A. Indicators of Agricultural Development			
1. Crop intensity	0.8619	1.8302	1.153
2. Irrigation intensity	2.1880	1.0301	1.448
3. Per agricultural worker ava ability of net area sown	3.4588	4.2644	4.484
4. Area under commercial crops	5.6407	4.0654	3.592
5. Per hectare productivity	2.0584	2.2851	3.318
Index of Agricultural Development	1.5857	1.5117	2.520
	1961	1971	1781
B. Indicators of Industrial Development			
1. Per capita net domestic product	2.0221	2.7954	3.090
2. Per capita ex-factory value of output	8.5999	7,9122	7 <b>.</b> 590
<ol> <li>Per capita value added by manufacture</li> </ol>	7.5163	8.4264	7.464
되는 문문 이 사람이 사용되었다. 아이들은 요리 하는 나를 하는 것 같습니다. 그렇	al 7.7686	6.0223	4.698
4. Per capita productive capit			
	7.8098	7.1547	6.043

regional disparity in industrial development may be attributed to the fact that since the beginning of the Second Five Year Plan, the policy of the balanced regional development has been being followed.

# Policy Measures Adopted Under Five Year Plans For Balanced Regional Development

The First Five Year Plan was only preparatory, hence the question of balanced regional development did not arise at this stage. The Second Five Year Plan recognised the necessity of keeping this problem fully in view. It said, "In any comprehensive plan of development, it is only axiomatic that special needs of less developed areas receive due attention. The pattern of development must be so devised as to lead to balanced regional development". The Second Plan contained some more important programmes for balanced regional development. However, the Second Plan made only a beginning in the direction of achieving a balanced regional as well as industrial development.

In the Third Plan, programmes for the extension of benefits of economic progress to the less developed region and a wide spread of diffusion of industries were suggested as a part of the effort to even out regional inequalities. Emphasis was laid on the systematic identification of underdeveloped regions as well as the promotion of studies of economic trends and rates of growth in different regions. Some backward regions were assigned a significant share in industrial development. For example, the expansion of

Rourkela Steel Plant and the establishment of fertiliser factory in Orissa and shippard construction in Kerala. Further, it was proposed to start new textile and light engineering industries in the backward areas.

The problem of regional imbalance had assumed such a dimension that the Planning Commission accorded priority to its solution in the Fourth Plan. In 1968, the National Development Council set up the Wanchoo Committee to recommend specific measures for attracting new industries in backward areas. Another Committee headed by the then Planning Commission Secretary Mr. B.D. Pandey was asked to go into question of the identification of backward areas.

Thus the Fourth Plan took the comprehensive view of the factors responsible for backwardness of a region and proposed that a multi-directional area development approach should be adopted in order to accelerate the development of a backward areas. It was felt that an essential pre-requisite for accelerated development was the evolution of appropriate location-specific strategies based on a careful identification of causes of backwardness as well as potential available for development.

The most significant development in respect of the reduction of disparities, in the Fifth Five Year Plan, was the launching of the National Programme of Minimum Needs with an outlay of Rs.2803 crores, under which action was taken to take care of marked deficiencies of social consumption in

backward areas by extending facilities for elimentary education, rural health, water supply, nutrition, rural roads, rural electrification, etc.

In the Sixth Five Year Plan, there were specific schemes to provide additional central funds for mitigating the problems of certain types of areas with special ecological or social problems. There were schemes for hill areas, tribal areas, and drought prone areas. Certain other schemes of rural development directed towards improving the conditions of targets groups like small farmers and agricultural labourers also tend to be located in the backward areas.

After a steady progress during the first four years of the Seventh Five Year Plan, the growth of industrial production particularly in the manufacturing sector has dropped rather sharply during 1989-90. Latest data available on the index of industrial production shows an overall growth of only 5.2 per cent during April-November 1989 as compared to 3.4 per cent of the previous year.

There has been a marginal increase in number of industrial licences issues for backward areas in April-December 1989 compared to those issued in the corresponding period of the previous year. But less number of letters of intents were issued for backward area during the period, i.e. 422 compared 479 in April-December 2/1988. The number of registrations issued by the Secretarial for Industrial Approvals under the Delicensing Scheme also showed a nominal

fall, 560 as against 563 in April-December 1988. DGTD registration issued to backward areas during the period declined to 175 from 298 in April-December 1988. These available indicators owing to their mixed behaviour do not present a clear picture of the flow of industrial investment to backward areas during the year 1989-90.

Lack of adequate infrastructural facilities is one the major impediments hindering the industrialisation backward areas. With a view to overcome this impediment, the Union Government decided in 1988 to set up 100 growth centres, spread across the country over the next five years or so. It was decided initially to set up 61 growth centres in the first phase. These centres were allocated to 16 major states, 9 smaller states and union territories; based on three criteria : population, area and industrial backwardness as measured by inverse of the ratio of number of factory workers to the population of the state. In October nine more growth centres were sanctioned raising the total number of growth centres to be set up in the first phase of programme to 70. Distribution of these growth centres among the states and union territories are as follows : 8 Uttar Pradesh, 6 each in Bihar and Madhya Pradesh; 5 each in Maharashtra and Rajasthan, 4 each in Andhra Pradesh and Orissa; 3 each in Assam, Gujaratl, Karnataka, Tamil Nadu West Bengal; 2 each in Haryana, Jammu and Kashmir, Kerala and Punjab; and 1 each in Arunachal Pradesh, Manipur, Meghalaya, Mizoram. Nagaland, Pondichery and Tripura. 10

## The New Industrial Policy : Changes for a New Beginning

The policy measures announced recently (June 1790) by the Union Government regarding the development of small scale and agro-based industries and changes in procedures for industrial approvals have given rise to an impression that a comprehensive Industrial Policy has been announced.

The central objective of the policy changes revolve around the determination to increase the employment potential of industrial growth. It aims at an equitable dispersal of industries in backward areas including rural areas, so that the problems of regional imbalances in growth can tune with the declared overcome. In aims o f decentralisation, the new policy measures have given the state governments all freedom to provide the motive force regarding small scale industries. In the case of medium scale industries, investments up to Rs.25 crores in backward areas and Rs.75 crores in centrally notified backward areas have been exempted from all licensing controls. The location will be decided by the state governments in keeping with the policy of each state in this respect. Similarly, environmental clearance will have to be obtained from the state governments according to procedures prescribed by them. Only in metropolitan cities with population of 4 million, certain restrictions location has been indicated so that overcrowding may avoided.

Inter-regional disparities in India's agricultural development may be largely attributed to uneven growth of capital and human skills over regions resulting mainly from the absence of an appropriate strategy of development. 11 During the past few decades the planners and policy makers in India followed a very short-cut, albeit dualistic path of agricultural development by selecting certain favourable poles where the potentials for immediate growth relatively high. Although this growth pole strategy yielded result in term of agricultural output substantially, since growth occured in the selected regions and pockets which were better endowed with facilities of irrigation, credit and other infrastructures, the net outcome of such a strategy was the widening of developmental gap between the rich regions like Punjab, Haryana, Gujarat and Maharashtra on the one hand and the poor regions like Bihar, Assam, Orissa, West Bengal, Uttar Pradesh and Madhya Pradesh on the other. Even within a rich region, there were a few pockets which developed at a relatively faster rate than the rest of the area in the same region due to such bourgeois, albeit irrational strategy of agricultural development.

The growing regional imbalances in agricultural development cannot be corrected without far reaching, changes in the strategy of development in fact the situation demands not only a shift in our national allocation of funds and projects in favour of the poorer regions, but also a radical change in the order of development priorities. For instance,

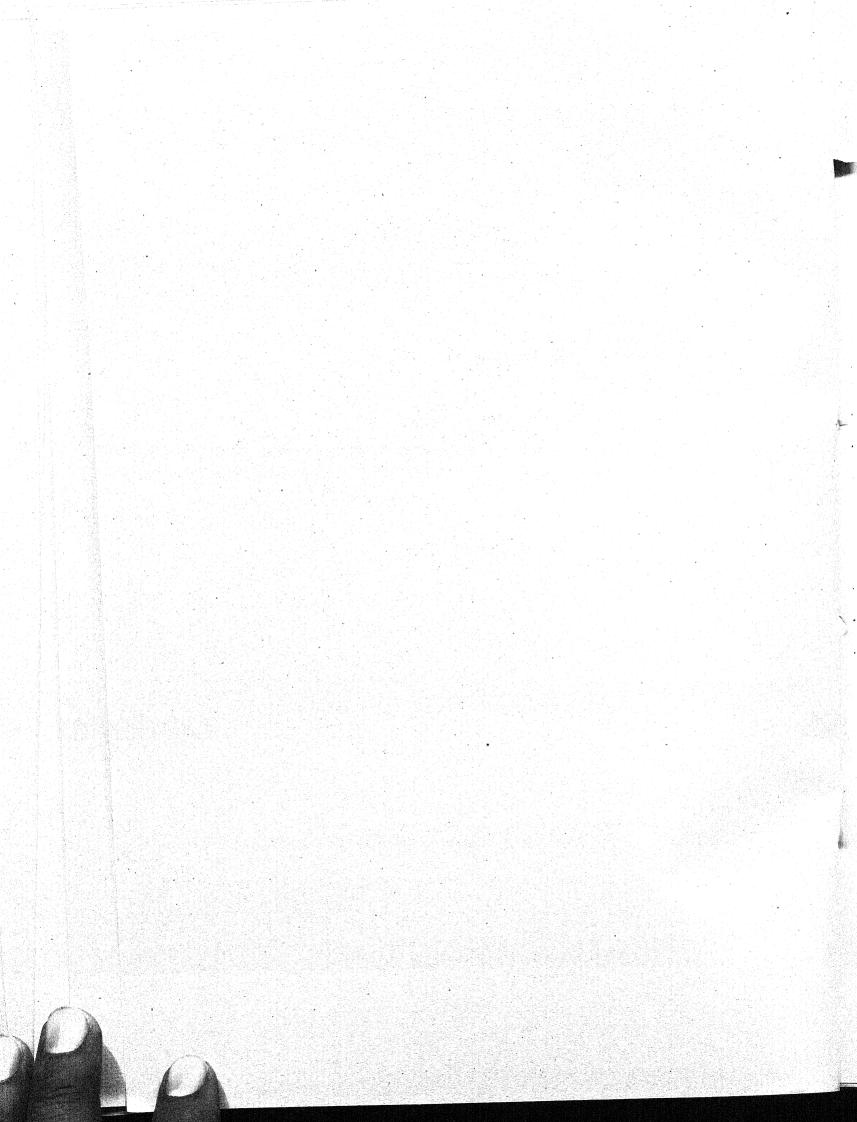
Bengal, the rate of agricultural growth is slow not only because of the absence of institutional and infrastructural facilities of credit, irrigation, marketing etc. but also due to the unproductive agrarian structure being characterised by the existence of exploitative tendency, fragmentation of holding, and under-utilisation of land, water and other resources by the large farmers. Therefore, agrarian reforms and institutional changes must precede any effort to bring about technological innovations for rapid agricultural development in the poorer states of the country.

The development experience in our country shows that the geographical distribution of general sectoral programmes tend to leave large parts of the country unaffected. The multiplier effects of general sectoral programmes are too weak to benefit the backward classes and areas. Hence, it seems necessary to continue special schemes with ear-marked benefits for target areas and target groups. For correcting regional imabalances, a shift in area orientation is indispensible. Besides, a great drawback of all backward area schemes is that there is hardly any feed back about the actual physical progress of these schemes in the field. Also, the total development outlays per capita available to less developed areas (including special allocations) remain small in comparison to those in the developed areas.

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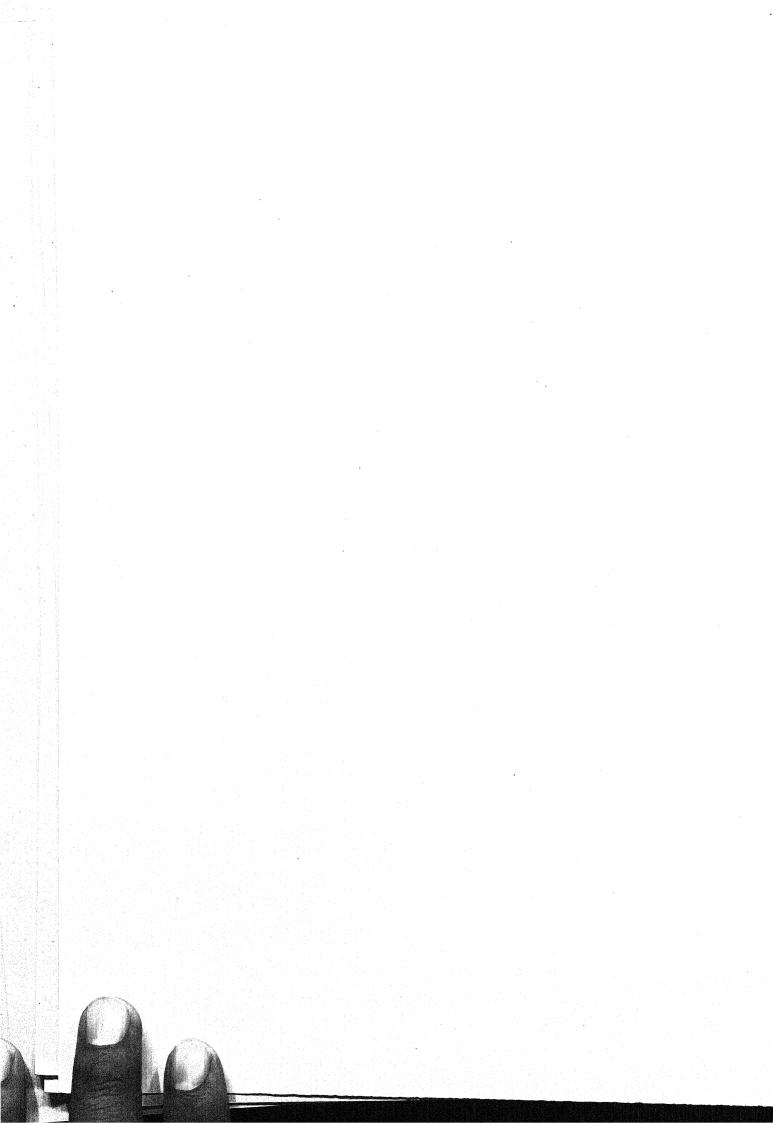
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Table\_II
REGIONAL DISTRIBUTION OF COMPOSITE INDEX OF AGRICULTURAL DEVELOPMENT IN INDIA

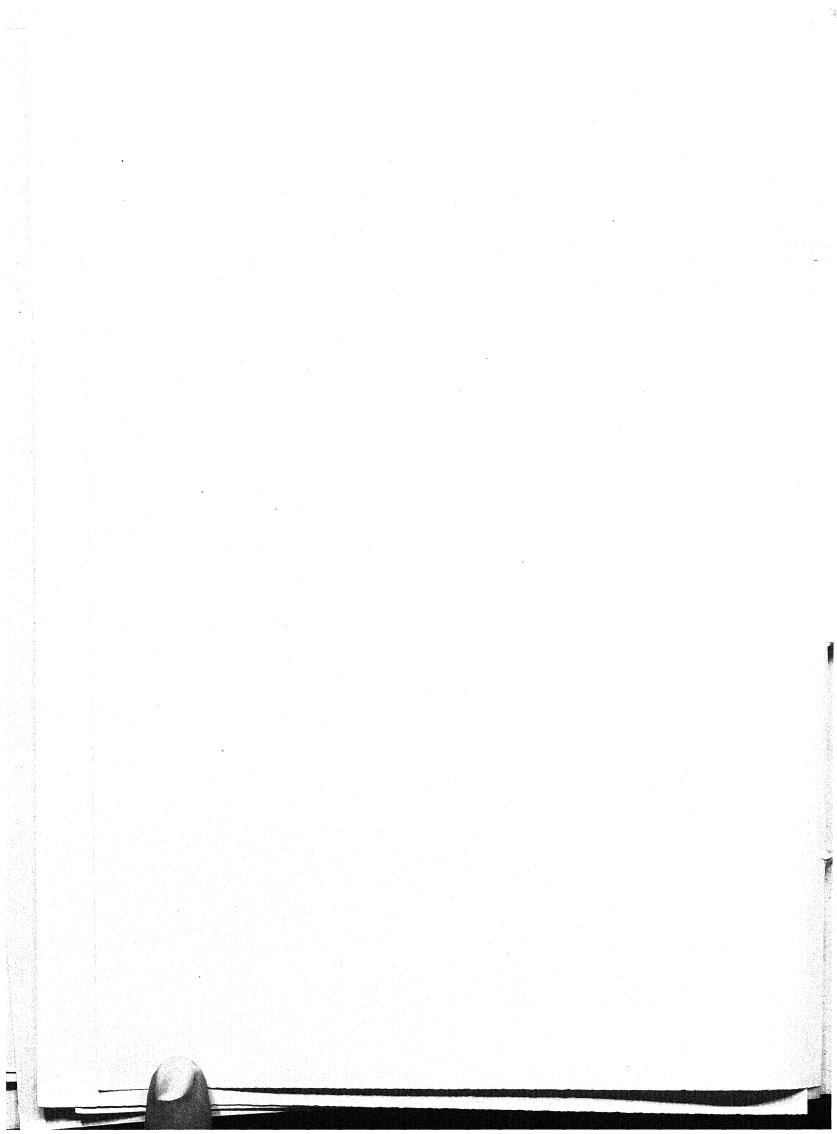
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# AGRICULTURAL PRODUCTIVITY, FINANCE AND GROWTH: STATE-WISE VARIATIONS

A.K. Das and P. Basu\*

## 1. Introduction

The thrust of this paper is on state-wise differences in agricultural productivity and growth in India. The analysis is for farm business as a whole.

### 1.1 Approach

Since it involves many crops and the producer is interested in not only higher productivity, but also better prices for the produce, the productivity of land has been measured in terms of money value of the product per unit of area. Area has been considered here in three senses, viz. Gross Cropped Area (GSA), Net Sown Area (NSA) and Gross Area Under the Selected Crops (ASC), which is different from GCA since only major agricultural crops have been included in the analysis.

Valuation has been made at all-India prices in order to eliminate the effect of inter-state difference in prices. Value of the output per hectare of NSA and ASC has been compared between the states in Section 2, for the agricultural year 1980-81, 1981-82 and 1982-83. An attempt has also been made to relate it with outstanding institutional finance per hectare of GCA for the years 1981, 1982 and 1983, by using Kendall's Tau Test (Kendall, 1962).

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Section 3 undertakes an analysis of the state-wise pattern of agricultural growth. Here also, we have studied the growth pattern of money value of agricultural produce rather than the output index for the reasons mentioned earlier. This approach, no doubt, is little unconventional. However, it must be ensured that cultivators, particularly smaller ones, can meet the rising cost of cultivation and yet become economically viable in the sense that they can cover their domestic expenditure out of net earnings from agriculture (Vyas and Namboodiri, 1979, p.13 and Basu, 1982, pp.96-97).

From this point of view it is not sufficient to raise the growth rate of physical output, it is also important that farm harvest prices increase at a rate fast enough to make them remunerative. To capture the combined effect of these two factors, we have preffered to highlight the inter-state difference in the rate of growth of value of the agricultural produce for the period 1970-71 to 1982-83. As before, valuation has been made on the basis of all-India prices of crops in order to consider the effects of rise of production and overall farm harvest prices abstracting from the influence of inter-state price differentials.

## 1.2 Type and Sources of Data

For studying the relationship between money value of output per hectare of NSA and ASC and institutional finance per hectare of GCA, state-wise figures have been obtained in

respect of total outstanding credit to agriculture by institutional agencies, gross cropped area, net sown area and gross area under selected crops, production level of eighteen major crops and their farm harvest prices. All these figures are for the years 1980-81, 1981-82 and 1982-83, credit figures for the commercial banks relating to the end of December and those for cooperatives, to the end of June.

For estimating the growth of money value of agricultural output (at current all-India prices), state-wise time series data have been collected in respect of production of eighteen major crops considered and their farm harvest prices for the period from 1970-71 through 1982-83.

These data have been collected from published sources listed under the appropriate tables.

## 2. Productivity in Agriculture

All—India prices have been pooled from the state—wise farm harvest prices and output levels for the eighteen major crops considered (paddy, jowar, bajra, wheat, gram, tur, sugarcane, tobacco, cotton, groundnut, rapeseed and mustart, sesamum, linseed, casterseed, jute, blackpepper, dry ginger and dry chilli). The inner product of this price vector and the output vector for each state has been taken as the money value of the agricultural product of the state. From this we have computed productivity per hectare of GCA, NSA and ASC.

This section deals with the existing inter-state differences in productivity in this sense and also relates

this agricultural productivity with the per hectare institutional finance to agriculture.

It is worthwhile to mention here that in the present analysis, the figures collected and computed relating to the prices, quantities and hence productivity, have been limited to the eighteen major crops selected for the purpose of investigation, since it is difficult to collect state—wise data for all the minor crops.

While calculating the productivity i.e., money value (at current prices) of agricultural output per hectare and the inter-state comparison thereof, net sown area (NSA) and gross area under selected crops (ASC) have been used as divisors. It may be noted here that the use of GCA in place of ASC as divisor in this context would have underestimated the productivity.

## 2.1 Inter-state Difference

In a vast country like India with large differences in soil conditions, climate, farm practices and socio-economic characteristics of farm households, agricultural productivity differs sharply from one state to another (Statistical Statement 1). This is confirmed by coefficients of variation of productivity, which are high and on the increase during the years under investigation, as revealed by the Statement under reference.

So far as the productivity in relation to the net sown area is concerned, the central region comprising of

Rajasthan, Madhya Pradesh and Maharashtra is found to have the poorest scores among all other states, the exception being Gujarat. Their positions all through the three years under study have remained more or less the same. The overdependance of these states on monsoons and consequently, the frequently recurring droughts, may be one major cause for the poor performance of these states (Bhalla & Tyagi, 1989, p.A46). Figures for the two Southern states of Karnataka and Kerala and those for the states of Bihar and Orissa in the Eastern region have also been found to be quite on the side. The notable feature here is that of Kerala which has recovered significantly from its earlier low position. Exactly opposite has been the position of Bihar which has been relagated from nineth and sixth position during the period under study. The states in the Northern region, with the one exception of Himachal Pradesh, as expected, are found to occupy the top slots.

Till now we have abstracted from the influence of cropping intensity. Even when this aspect is brought into picture (productivity related to the area under selected crops), the relative positions of the states do not change much. The states like Punjab, Haryana, U.P. and West Bengal which rank high in terms of productivity per hectare of NSA are also the states where productivity is high in relation to ASC. This seems to suggest that cropping intensity tends to be high in the states where crop-wise yield rate is also generally high. However, the positions of states like

Kerala, Karnataka, Jammu & Kashmir have improved considerably when the ranking is done by per hectare of ASC rather than NSA. One of the factors to which this phenomenon may be attributed is omission of crops like cocunut, cashew, spices etc. which are particularly important in these states. States behaving somewhat similar to this, but to a lesser degree are Maharashtra, Himachal Pradesh, Gujarat etc.

## 2.2 Productivity Per Hectare and Finance Per Hectare

Credit being an important input for farm production, it would be interesting to study the nature of association between productivity and institutional finance per hectare. This relationship has been studied (with the help Kendall's Tau Test) first in terms of per hectare of NSA then in terms of gross area. In the second part, on the same logic as before, we have taken ASC as the divisor while calculating productivity or money value of agricultural output per hectare. However, while presenting the data on per hectare institutional finance to agriculture, we have used GCA as the divisor, because institutional finance figures concern all the crops. Since crop-wise data on agricultural credit provided by all the institutions area not available, productivity per hectare of ASC has been compared with finance per hectare of GCA, as a solution has compared with finance per hectare of GCA, as a solution of the second-best variety.

Under institutional finance, we have included credit provided for three periods i.e., 1980-81, 1981-82 and 1982-

by scheduled commercial banks including the regional rural banks, primary agricultural credit societies (PACS) and land development banks (LDB). Statistical Statement 2, presenting data on productivity and finance per hectare reveals, in general, a positive association between the two variables. Kendall's Tau Test suggests that the relationship is positive in all the three years, statistically significant in 1982-83 only (Table 1). It be observed from Statistical Statement 3 that, by and large, a positive association between productivity per hectare area under selected crops and institutional finance hectare of gross cropped area has been a feature of all the three years considered. Rank correlation test at five per cent level of significance confirms significant positive association between them in each year under consideration. (Table 1). Thus, farm finance, among other things, is found be playing a crucial role in enhancing productivity in agriculture.

Table 1: Kendall's Tau Coefficients Between Finance and Productivity

Year	Finance/ Producti		Finance/G Productiv	
	T are	z	Ta.	
1980-81	0.1912	1.0706	0.5147*	2.8823
1981-82	0.2206	1.2353	0.5588*	3.1294
1982-83	0.4117*	2.3055	0.5882*	3.294

<sup>\*</sup> Significant at five per cent level.

#### 3. Agricultural Growth

This Section gives the method and the findings of the analysis relating to agricultural growth, the broad approach being already outlined in sub-section 1.1.

## 3.1 Methodology

For estimating the growth rate of money value of agricultural output, crop-wise all-India prices for thirteen years have been computed from their state-wise farm harvest prices and the output quantities in the respective years considered. As mentioned before, these all-India prices have been used to obtain a time series of the money value of agricultural output. Then growth rates have been estimated for different states (seventeen major states).

Regression (OLS) method has been applied to estimate the rate of growth of money value of agricultural output for the states. Out of the two alternative functional forms used in this context, the linear model is specified as:

$$Q = a + bt + u_t$$
 (i)  
and the exponential form used is specified as:

$$Q_{t} = a (i + r)^{t} u_{t}$$
 (ii)

where Q denotes output in nominal terms t stands for time (in discrete years)

and u is the stochastic term

For equation (i), the simple growth rate is obtained by dividing the estimate of 'b' by the average money value of agricultural produce. For equation (ii), the first step for obtaining the annual compound growth rate (r) is linearisation of the model as :

In  $Q_t=c+dt+v_t$  where  $c=\operatorname{In} a=a\operatorname{constant}$   $v_t=\operatorname{in} u_t$  and  $d=\operatorname{In} (i+r)$ , r being the annual compound growth rate

The coefficient on time, d, is actually the continuous rate of growth. As it closely approximates the annual compound growth rate, the standard errors of d may be taken as the approximate standard errors of r (Boyce, 1987, p.258. These standard errors computed in the exponential model provide a convenient measure of the stability factor associated with growth. In other words, they represent the extent of deviations around the time trend, which are unit comparable across time and space as long as time periods compared are of eual length.

# 3.2 Inter-state Variation in Growth of Output

So far as the growth pattern of the value of agricultural output is concerned (over the period 1970-71 to 1982-83), both the linear and exponential forms were found to give good fits with reasonably high  $\frac{-2}{R^2}$  and no significant evidence of positive autocorrelation. As shown in

Statistical Statement 4, the  $\overline{R}^2$  values have been quite high and considerably close to each other for both linear and exponential cases. But as the DW values suggest, the exponential form, which implies constant rate of growth, gives a slightly better fit than the linear form.

Since these two usual forms performed well, we have not considered alternative functional forms, like the log-quardratic or kinked exponential form, which have received much attention in the recent literature on agricultural growth (Boyce, 1987, pp.257-271).

As the figures in Statistical Statement 4 indicate, states in the Eastern region, namely Assam, Bihar, Orissa and West Bengal, occupy the lowest positions in terms of the rate of growth of agricultural output. This is true both in the cases of linear and exponential forms.

Among other states, growth rates in the cases of Punjab, Rajasthan, Uttar Pradesh, Maharashtra, have been truely phenomenal. This is as expected, since, with the exception of Rajasthan, rest of these states are considered to be the mainstay in the realm of Indian agriculture. The states in the Southern region also experienced medium rates of growth, the maximum being that of Andhra Pradesh. For Andhra Pradesh, the massive extension of modern technology to Paddy, which is the major crop in the state, seems to be an important factor for the high growth rate.

As regards the stability of the exponential growth rate, which is judged by the standard error of the coefficient of time, Haryana stands out among all the states. States like Uttar Pradesh, Karnataka, Kerala and Madhya Pradesh also seem to have followed a remarkably stable exponential growth path. It may further be noted that all these states including Haryana, have medium to high rates of growth of nominal output. The states which have shown low stability, include Andhra Pradesh, Himachal Pradesh, Orissa, Bihar, West Bengal, Assam, Maharashtra etc. The remaining states of Tamil Nadu, Gujarat, Punjab and Rajasthan have shown moderate stability.

Since valuation has been made at all-India prices, it may be noted that the ranking of the states according to our rate of growth of nominal output, will not be much different from their ranking by the rate of growth of physical production for a comparable period. Of course, there may be a few exceptions, because prices of all the crops do not rise to the same extent over different states and the cropping pattern differs from state to state.

## 4. Conclusion

It is alarming to note that, on the whole, states like Gujarat, Karnataka, Orissa, West Bengal, Assam and Himachal Pradesh etc. with a lower productivity per hectare of cropping area have also exhibited low to medium rates of growth and comparative lack of stability. On the other hand, states like Haryana, Punjab and Uttar Pradesh having higher level of productivity, have shown higher rates of growth.

with medium to high stability. This implies that the regional disparities in the levels of agricultural productivity and growth are generally on the increase. There are, of course, a few notable and welcome exceptions like the states of Rajasthan and Maharasthra with low levels of productivity and high rates of growth of farm output in value terms.

One of the various measures suggested for reducing such disparity is to increase the flow of institutional credit to agriculture. The present study has found a significant positive association between finance per hectare of gross cropped area and productivity per hectare of gross area under the selected crops.

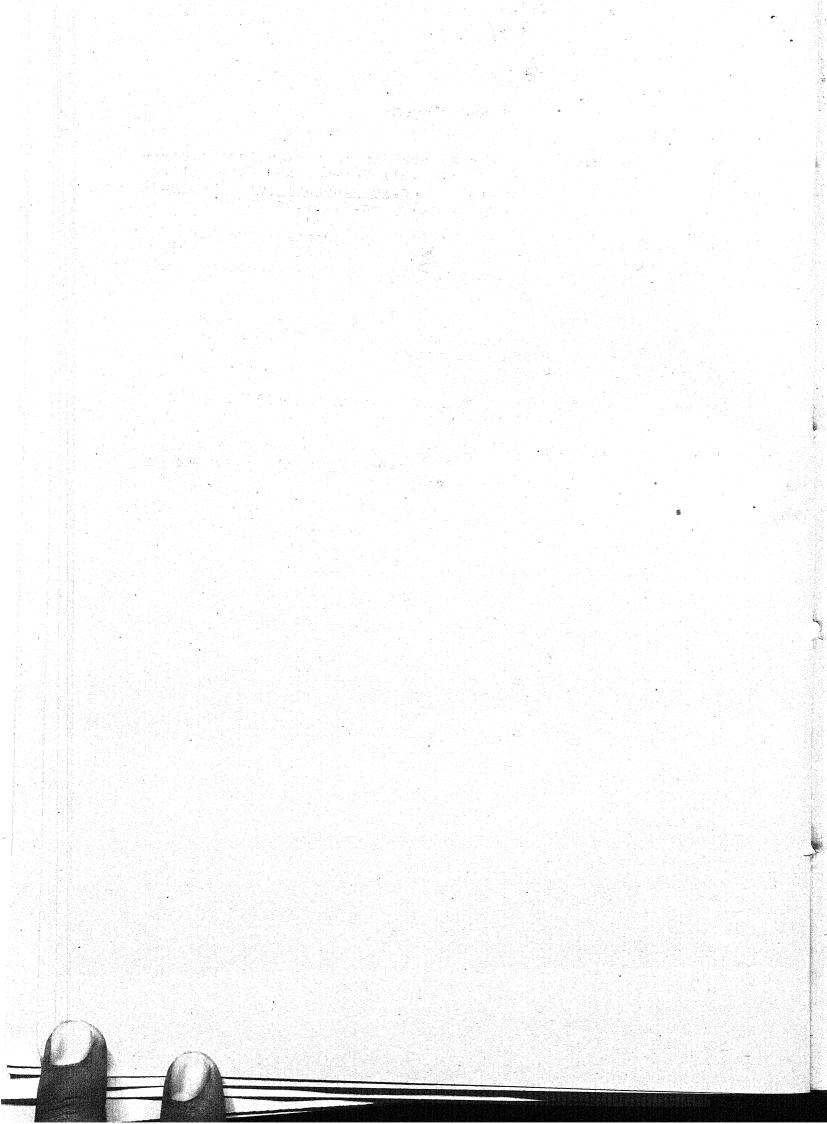
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## MACRO, REGIONAL AND SUB-RECIONAL DISPARITIES IN INDUSTRIAL DEVELOPMENT OF RAJASTHAN"

DR. SIDDHARTH SYASTRI \*

The low level of industrial development may be largely attributed to lack of basic infra-structure and the low level of investment by central public undertakings which could have generated the requisite multiplier effect. The relative under-development of industrial sector in the State becomes obvious when compared with rest of India. If the number of factories, factory employment, productive capital, gross out put etc. in the State are seen as percentage of corresponding figures for India as a whole, the share of Rajasthan varies in between little over two to little over three percent. For instance, Rajasthan has less than 3% of registered factories in India while Maharashtra has over 16%. Similarly Rajasthan's share in factory employment is little over 2% while that of Maharashtra is about 17%.

All though there has been appreciable economic progress in Rejasthen during the planning period in many respects including the growth of industrial units, the State has still

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All though government had been providing a number of indentives to new enterpreneurs to set-up industries in the State, yet there is vast potential still left for being tapped. The rich mineral potential, livestock wealth and other inputs for agro-based industries coupled with the skillwidely dispersed in the state and enterpreneurial capability of its people has yet to be harnessed effectively for an accelerated growth.

The situation is even worse when we think in terms of balanced industrial development. It is hypothesised that there are considerable macro, regional and sub-regional levels disparities in the economy of Rajasthan. An attempt has, therefore, been made in this paper to measure and indicate the degree of disparities in the economy of Rajasthan. It has also been attempted to examine whether there has been any reduction in disparities because of the emphasis on balanced regional development in development plans. The study of imbalances at different spatial levels would throw light on the importance of areal consideration in planning.

The present study would examined imbalances at macro; regional and sub-regional levels by employing balance ratio, coefficient of imbalance, index of regional imbalance and index of intra-regional imbalance as the tools of analysis. These techniques are simple and lucid and provide sufficient clue to the extent of regional imbalances. These techniques together give sufficient information for formulating region specific strategies.

Belief introduction of the techniques along with their
A brief computational procedure is being attempted below:

## Let :

- S denote the norm region
- r denote the region
- K denote the sub region
- N denote non-negative numerator indicator
- D denote non-negative donominator indicator
- X denote relative indicator
- Y denote balance ratio
- A denote the index of regional imbalance
- C denote Coefficient of imbalance
- I denote the index of intra-regional imbalance Then,
- Nsj is the jth numerator indecator of the norm region.
- Nrj is the jth numerator indicator of the region.
- NKj is the jth numerator indicator of sub-region.
- DSj is the jth numerator indicator of the norm region.
- Drj is the denominator of the region
- DKj is the jth denominator of the sub-region.
- 1. Calculating the relative indicator i :

The ratio of numerator indicator and denominator indicator is relative indicator and is calculated as follows:

(a) For the norm region

Xsi = <u>Nsi</u> Dsi

<sup>\*</sup> The methodology used here has been adopted from S.K.Mandal, "Regional Disparities and Imbalances in India's planned Economic Development", (Chapter 2, Deep and Deep publications, 1987.

(b) For the region

(c) For the sub-region

A region is used here as a contiguous geographical and socio-economic entity delimited as a combinations of administrative sub-regions. A sub-region is a contiguous geographical entity below the region. A norm region is a region selected for measurement and/or comparison of imbalances.

Calculation of balance ratio with respect to relative

Calculation of balance ratio with respect to relative indicator i:

> A ratio of the relative indicator and the corresponding norm is a balance ratio. A positive relative indicator of a norm region is called as norm.

(a) Norm region

(b) Region

(c) Sub-region

The ideal xx value of balance ratio is unity. Its opposite extreme value is Zero. The technique of balance

ratio is supposed to be indicating the relative development starts following the system given below:

Value of Balanc ratio( r ) Status of Relative Development

 $0.0 \leq Y < .6$ 

Poor

.6 = Y = .9

Moderate

.9 = Y < 1.5

balanced

1.5 and above

High

The cut off points are arbitarary and based on value judgements.

3. Co-efficient of imbalance of ith relative indicator:

The coefficient of imbalance is a summary major describing the intra-regional imbalances with respect to a relative indicator.

x 100 Disaggregated as district level

x 100 Disaggregated

m = number of sub-regions within the norm region

1 = number of regions.

(b) Region

$$cri = \left[\frac{2}{k}(\sqrt{\kappa i} - 1)^2/m\right]^{\frac{1}{2}} \times 100$$

me number of sub regions within the region.

The ideal value of the coefficient of imbalance is zero. It helps test the representative character of the balance ratio at the aggregate level. It has operational significance in deciding priorities among different relative indicators. The

objective of balanced development suggests higher priorities to the relative indicators having higher coefficients. The coefficient of imbalance is used in the study as an important tool of analysis.

## 4. Index of regional imbalance:

The index of regional imbalance is a summary measured describing the imbalances in the given region or sub-region with reference to a particular norm region and specified relative indicators.

$$Rr = \begin{bmatrix} \frac{1}{2} (xri - 1)^2 / n_i \end{bmatrix} \times 100$$

(b) Sub-region
$$Rk = \left[\frac{m}{2}(y_{ki} - i)/m\right]^{y_{ki}} \times 100$$

n = number of indicators.

It has no operational utility. As such it is used for broad comments only.

## 5. Index of intra-regional Impalance:

The index of intra-regional imbalance is a summary measure describing the imbalances within the region with specified sub-regions and relative indicators.

## (a) Norm region

x 100 at sub region level

(b) Region

$$Ir = \begin{bmatrix} \frac{n}{2} & \frac{2n}{2} \\ \frac{2}{1+2} & \frac{2}{k+2} \end{bmatrix} (yk1-1)^2 / nkn \times 100$$

Like the index of regional balance this is also used for broad comments only as this has no operational significance.

For the purpose of present study, Norm region, region and sub-region have been chosen in the following manner:

Norm Region: Rajasthan as a whole has been taken as norm region. Rejesthan can be divided into plains, Hills and Plateau. Region: The plains can further be divided into Western Sandy and Eastern Plains. Thus, there are four demarcated natural geographical regions in Rajasthan, namely, the Western Sandy Plains, Aravali Range and Hilly Region, Eastern Plains and South Eastern Plateau Region. These four natural divisions of Rajasthan have been adopted as regions of Rajasthan. The number and names of the districts falling within various regions may be seen in Tables-8, 9, 10 2 11. Sub Region: The administrative boundary of district falling within a region have been taken as sub-region mainly because of the nonbity of data relating to most of the indicators at levels lower than district. This exercise would be helpful to district planning authorities in formulating appropriate development policies and programmes.

The study covers a period of 15 years beginning from 1969-70 to 1984-85. These are the earliest and the latest years for which necessary information is available. Disparities have been considered at two points of time i.e., for the years 1969-70 and 1984-85 in order to examine the trend in the extent of disparities in Rajasthan.

The following six relative indicators have been used to ascertain the level of industrial development.

- 1) Number of Factories/Population
- 2) Number of Factories/Area
- 3) Productive Capital/Employment
- 4) Productive Capital/Number of Factories
- 5) Factory EmploymentyPopulation
- 5) Gress Output/Population

The main source of data is Directorate of Economics and Statistics. Population and area figures are as par 1971 and 1981 census.

## IMBALANCES IN PAJASTHAN:

The measurement and examination of imbelances in Rajasthan is being attempted below:

### Imbalances at Macro Level:

The extent of imbalances at macro-level i.e. in the economy as a whole has been analysed with the help of index of Intra-Regional Imbalance and the coefficient of Imbalances with respect to different relative indicators.

Table-1 shows the level of inter-regional and inter-district imbalances in the economy of Rajasthan as a whole for the two periods. It may be observed from the Table that there has been decline in the degree of Imbalances in Rajasthan between the two points of time under consideration. Further the extent of inter-district imbalances has been found to be higher than that of inter-regional imbalance in both periods. The index of interregional imbalances in Rajasthan Worked out to be 154.13 and 53.28 in 1969-70 & 1934-85, respectively showing a fall of 178.82 percent whereas the index of inter-district imbalance was found to be 227.63 and 120.66 in 1969-89 and 1984-85, respectively registering a 20.66% decline. Thus, inter-district imbalances has not only been greater than the inter-regional imbalance, rather it has also shown comparatively smaller degree of fall. This suggests that regions in Rajasthan are coming closer to one another faster than districts.

The coefficient of imbalances of different relative indicators are given in tables-2 and 3. The Table-2 shows the Coefficient of imbalance when relative indicators are taken at regional level. The coefficient of imbalance in Table-3 have been computed at District level. At regional-level, productive capital per factory has shown maximum amount of imbalance followed by No. of factories in relation to area, per capita gross output, productive capital per unit of employment and so on. Number of factories in relation to population has shown least amount of variation and it is followed by proportion of factory employment in total population is followed by proportion of factory employment in total population

The coefficient of imbalance is seen varying from 24.80 in case of the factories/population to 91.77 in case of capital/factories giving a range of 56.97 and the coefficient of range equal to .499.

of imbalance of different indicators in Rajasthan disaggregated at district-level is some what higher than found at regional-level.

It is .574 against .499 found at regional-level. However, the pettern of dispersion of different relative indicators is almost similar at two levels. It may be observed from the Tables-2 and 3 that all indicators have indicated higher coefficients of imbalance at District-level in comparison to those at region-level. The low extent of imbalance at regional level in comparison to that at District-level may be attributed besides other factors to the macrosectoral approach to development planning which is in vague. In order to tackle the problem of imbalance effectively, the problem must be viewed at lower areal levels and the approach to planning should be area specific.

## IMBALANCE AT REGIONAL-LEVEL:

Impalances in three regions of Rajasthan have been examined with the help of balance ratio, coefficient of imbalance, index of regional imbalance and index of intra-regional imbalance. Table-4 presents values of balance ratios of relative indicators in four regions of Rajasthan. It may be observed from the table that in Western-Sandy Plains no indicator has high value of balance ratio. In respect of factory/population and factories/area this region has been found balanced vis-a-vis the economy of Rajasthan. In case

of remaining indicators the region is obviously quite deficient.

favourably position though this region too has no indicator which possess high value balance ratio. The region is balanced in comparision to Rajasthan economy with respect to the indicator capital/employment. For indicators excluding factory employment/population for which balance ratio is poor, the remaining indicators have moderate values.

factories in relation to area are concerned. With respect to all the remaining indicators this region is balanced in compariston to Rajasthan's economy.

The south eastern plateau region is quite favourably placed with respect to indicators capital/factories, per capital out put and capital/employment. Balance ratios of these indicators have high values. Of the remaining indicators, whereas factory employment, copulation shows balanced value those relating to number of factories in relation to population and area are moderate.

The analysis of balance ratios of relative indicators in four regions of Rajasthan suggests that Western and the Hilly Region is not developed in respect of any of the indicators. Though the Eastern and the Plateau regions are more favourably placed than these two egions, the former is highly developed in respect of only one indicator hile the latter is so in respect of only three indicators.

The coefficients of impelances of different relative ndicators in four regions have been shown in Table-5. These coefficients re varied both between regions and for different indicators within the egions. HANG INTEREST OF FOR AS indicators are concerned, productive capital

per factory and per unit of employment generally shows high magnitude of the coefficient of impalance. In respect of other indicators values are high for only one of the regions.

capital per unit of employment and factories, per capital output in Patern plains and capital per unit of employment and factories, per capital output in plateau region. It may be observed that almost all indicators in plateau region. It may be observed that almost all indicators in plateau region. It may be observed that almost all indicators in plateau region. It may be observed that almost all indicators in plateau region. It may be observed that almost all indicators in plateau region. It may be observed that almost all indicators in plateau attent of variability in the coefficients. The relative extent of variability in the coefficients of imbalance of different indicators can be seen from the values of the coefficient of range.

It is maximum in western Flains. In case of Hilly and Flateau Regions the values are not only almost same but also donot differ significantly from that in case of Eastern Plains.

### INTER-REGIONAL IMPALANCE:

taking values of different indicators at region levels. So far as the extent of inter-regional imbalance is concerned hilly region has shown the maximum degree of diversity followed by Plateau region. Western Sandy Plains, and Eastern Plains in 1969-70. In period 1984-85 situation has changed. Maximum degree of diversity is now shown by plateau regions and the least by hilly regions. There has been 206.38 betcent present decline in the imbalance of the hilly region. The remaining three regions have also registered a decline in the imbalance ranging from 2.62 percent in case of hilly region to 25.49 percent in case of Eastern plains. It is thus obvious that there has been drastic change in the degree of impalance of the hilly region while small in that of

plateau region. The latter may therefore be kx taken as more or less stagnant so far as heterogeneity is concerned.

## INTRA-REGIONAL INBALANCE:

The intra-regional imbalance in different regions has been explained by taking data at district-level. The indices of intra-regional imbalances are given in Table-7. In terms of these indices plateau region was most heterogeneous in 1969-70 followed by Eastern Plains, Western Fleins and Hilly Region. The situation has, however, changed in 1984-85. Eastern Plains becomes the most hetetogeneous region followed by plateau, Hilly and the Western Regions. It may be seen in the Table that different regions have experienced different rates of change in the extent of intra-regional imbalances and even the direction of change has not been uniform. In Plateau and Western Regions and in Rajasthan as a whole there is a tendency of decrease in the imbalances while in the remaining two regions Extended a mibiliantetic been markenism t the imbalances have gone up. The fall in the plateau Region While the increase in the extent of imbalance have been maximum incase of Hilly Region.

## IMBALANCE AT DISTRICT LEVEL:

A study of imbalance at district level is made here in order to highlight the broad diversification of different districts. The district balance in terms of relative indicators has been presented in Tables-8,9,10 and 11. Different Districts of Western Region are poorly developed in respect of most of the indicators. Districts like Sarmer, Churu, Jalore and Magaur have poor values of balance ratios with respect to all the six indicators. In case of remaining districts

per factory and per unit of employment generally shows high magnitude of the coefficient of impalance. In respect of other indicators values are high for only one of the regions.

cooking region-wise, indicators with high intensity of imbalance are nil in Western plain; productive capital per factory in Hilly Regions; all but per capita butput in Eastern plains and capital per unit of employment and factories, per capita output in plateau region. It may be observed that almost all indicators in Western Plains shows high values while all the indicators in Western Plains indicate moderate values of the coefficients. The relative extent of variability in the coefficients of imbalance of different indicators can be seen from the values of the coefficient of range.

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also belance ratios are poor for most of the indicators. Only Ganga-Market Nagar, Jodhpur and Pali are highly developed in case of number of factories in relation to population as well as area. Bikaner also shows high balance ratios in respect of the former of the two indicators mentioned above.

poor (Table-9). Excluding Udeipur which shows moderate to balance values of balance ratios, the remaining districts are quite deficient in respect of all indicators except productive capital in relation to number of factories and employment.

Table-10 shows that districts of Eastern Flains arm, in general, comparatively much better placed. Excluding the districts of SikaryS. Madhopur, Tharatpur and Tonk which have poor values of belance ratios in respect of almost all the indicators. In case of Jaipur and Alwar all the indicators have moderate to high values, Remaining districts of Ajmer, Bhilwara and Jounjhumu present mixed picture with values ranging from poor to high.

balanced or high level of industrial development in Kota district with respect to all the indicators. Against this districts of Bundi and Jhalawar are either poorly or moderately developed. The remaining district Chittorgarh shows high values in respect of productive capital per unit of employment and factories while moderate values in case of remaining indicators.

## References:

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- 2. Five year Flans, Dovernment of Rajasthen.

Index of Imbalance in Rajasthan as a whole

Disaggregation Level	Index of Imbalance	
용 하고 있다면 되었다. 나는 보는 사람이 하는 것 하는 사람들은 보는 하면 하는 사람들이 되었다. 나는	1969-70 1984-85	% Change
1) Region	154.13 55.28	<u>- 178,82</u>
2% District	227.63 120.66	- 20.66

Coefficent of Imbalances in Rajasthan Disaggregated at the Regional Level.

Relative Indicators	Coefficent of Imbalances
1) No. of Pactories/ Population	24,80
2) No. of Factories/Area	51.62
3) Productive Capital/Employment	50,25
4) Productive Capital/No. of Factories	91.77
5) Factory Employment/Population	39.18
6) Gross out put/Population	50,77

Co-efficient of Imbalances in Rajasthan Disaggregated at District Level.

Relative Indicato		Co-efficient of Imbalance (1984-85)
1) No. of Factories	/Population	68.21
2) No. of Factories	Area	118,50
3) Productive Capit	el/Employment	110.83
4) Froductive Capit	11/No. of Factories	204.14
5) Factory Employme	nt/Population	80.45
6) Gross cutput/Fop	ulation	87.35

Coefficient Range

TABLE -4

Balance Ratios of Relative Indicators in Your Regions of Rajasthan,

	Western Sendy Plains	Aravall Sandy & Hilly Region	Eastern	South Eastern Plateau Region
1) No. of Factories/Fopulation	91.	0.63	CO T	0.72
No. of Pactories/Area	<b>7</b>	0	in O	c sa s
Froductive Capital/Employment	82.0	es C	0000	69.
Productive Capital/No. of Factories	٥. پاره	11.0	2	9 v.
Factory Employment/Population	60.0	0	C**	. 0
5) Gross Out put/Population	<b>Q</b>	3	12°1	

# TABLE-5

Co-efficients of Imbalances of Different Relative Indicators in Rajection and Regions as a whole 1984-85 (Disaggregated at District Level)

Range Coefficient of Range	<pre>50.00 50-100 100 and above</pre>	2) No. of Factories/Population 2) No. of Factories/Area 3) Productive Capital/Employment 4) Productive Capital/No.of Factories 5) Employment/Population 6) Gross Out put/Population	
17.35	0 6 0	75.96 80.69 66.91 84.26 58.06	Western Sandy Plains
126,97	jua p <mark>aka jua</mark>	51.69 66.90 32.79 159.76 61.23	Aravali & Hilly
348.05	4 2 O	71.25 177.25 107.65 419.30 114.50 84.98	Rnage Eastern Region Plains
188 <sub>4</sub> 61	30 3	45.57 44.32 207.36 232.93 47.43	South Eastarn Flateau Region
135,93	w 12 0	68.21 118.50 110.83 201.14 201.45 87.35	Rajasthan

TABLE- 6

Index of Regional Imbalances in Four Regions

Regions	1969-70	1984-85	% Change
Western Sandy Plains	57.87	55.04	= 23,31
Aravali Range and Hilly Region	93.08	30.38	- 206,38
Castern Plains	67.65	53.91	- 25,49
South Eastern Plateau Region	79.64	77,61	- 02,62

## TABLE-7

Index of Intra-regional Imbalance in Four Regions of Rajasthan

Regions	- Control of the control of the second of th	ntra-Regional	% change
	1969-70	1984-85	
1. Western Sandy Plains	103,30	80,46	- 22.12
2. Aravali Sandy & Hilly Region	59,65	103.14	+ 72.90
3. Eastern Plains	126.15	202.08	+ 60,19
4. South Eastern Plateau Region	522.85	141.42	- 72.95

TABLE -8

Balance Ratios of Districts for Different Relative Indicators, 1984-85 (Western Sandy Plains)

Relative Indicators	Sarmer	Sarmer Bikaner Churu	O Mru	Canga-	<b>Jalore</b>	Jaisalmer Jodhpur Nagaer	Jodhpur	Nagawr	Fall
1. No. of Factories/Population	เก	1.75	. 26	2.74	927	15	2.06	\$	2
2. No.of Factories/Area	e La	• 55	10	Ë	• 023	.009	5		o 3
3. Productive Capital/Employment	13	ò	•	N O	.016	<b>:</b> 8	Ü	i or	·
4. Productive Capital/No. of Pactories		<b>:</b>	8	<b>.</b>		<b>.</b> 52			<b>3</b>
5. Employment/Population	Ġ	8	05	ġ	• \$	•		<b>.</b>	5
5. Gross OutputpPopulation	• 0a		Ş	<b>6</b> <b>3</b> <b>8</b>	.0002	Ġ	<b>.</b> 99		. 9g

6 .. I

CABLE - 9

Balance Ratio of Districts for Different Felative Indicators, 1984-85 (Aravali Range & Hilly Region)

Relative Indicator	Benswara	Dungarpur	Strohi	tdaipur
1. No. of Factories/Population	0.27	0.35	0,29	1.02
2. No. of Factories/Area	0.48	0.064	2,20	
3. Productive Capital/Employment	06.0	6 4 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Š	?
4. Productive Capital/No. of Factories	?:	9	890	0,0
5. Employment/Population	***************************************	0,23	62 0	0,65
6. Gross Output/Population	os N	Ö	0,22	

MBLE-10

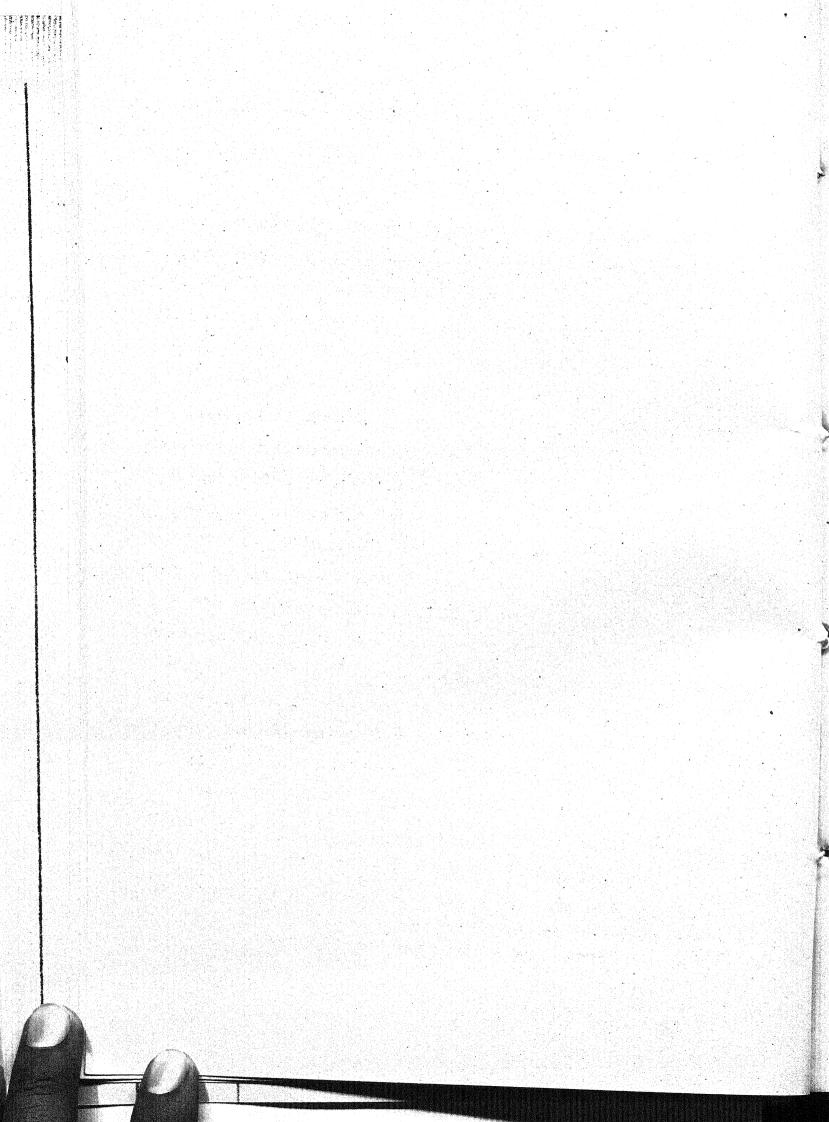
Dalance Ratios of Districts for Different Relative Indicators, 1984-85 (Eastern Plains)

	一方 は 一味 はず と ぬか あき			こうかい こうじゅうかい おんしゃばい できるをあたい		
	Bharatpur	Bhilwara	Jeipur	Bhilwara Jeipur Jhunjhuny Sikor C.: 24h-	Sikar	opur opur
1. No. of Factories/Population 1.0 1.81	*	2	2.27	0.60	27	
2. No.05 Pertories/Area 2.12 3.07 1	1.08	E UI	٠٠. ال			
3. Productive Capital/Employment 1.4 .16		•	د د الما			<b>.</b>
4. Productive Capital/No.of # 1.51 .17	Ų.	Ö	2,10	<b>ដ</b> •		
5. Employment/Population 1.08 2.0	is N		မ ငရ			.27 .10
5. Gross Output/Population 1.46 .11	ដ	l l	N O		<b>.</b>	

# 

Bulance Ratio of Districts for Different Relative Indicators, 1984-85 (South Eastern Plateau Regio

Relative Indicators	Bundi	Chittorgarh	Jhelawar	Kota
1. No. of Factories/Population	. 63	control projection of the second seco	. 19	1.03
2. No. of Pactories/Area	· 8	• 00	, N W	
3. Productive Capital/Employment	ú	r S	i de	ë
4. Productive Capical/No. of Factories	s La La	is Ca Ca Ca	1.05	1.90
5. Employment/Population			<b>.</b>	1.70
6. Gross Out put/Population	s tr	•	ģ	ω in H



REGIONAL DISPARITIES IN AGRICULTURAL CREDIT IN INDIA A study of Primary Agricultural Credit Societies

\* D.K. BAJPAI

Agriculture is the backbone of the nation's economy and the improvement in agricultural productivity is of paramount importance today. It not only provides food and other wage goods to our population, but also ensures a strong base for the development of industrial sector. Agriculture, like industry needs short, medium and long term investible funds. accelerated development of agricultural sector, it is essential that the farmers are provided with a pre-requisities like fertilizers, improved seeds, irrigation facilities, modern implements, marketing facilities, etc. without adequate and timely credit they cannot make use of these essential inputs. The use of better quality of inputs means greater demand for rural credit. Timely availability of credit to agriculturists at economic rate of interest, for agricultural purposes is needed by them. This is an essential condition for the healthy and sound functioning of an agriculrual economy. Adequate of credit is only one of the essential elements in a good credit system. Modern agriculre as distinguished from the traditional agriculure. requires large infusion of credit to finance, use of short term cash inputs such as inproved seeds fertilizers, insecticides, etc. Medium and long term investments for land improvements irrigation etc. also become much more essential for increas-

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ing agricultural production. Because savings in traditional agriculture tend to be relatively small, increased demand for working and fixed capital must come from increased supply of credit. Further, modernising agriculture requires co-ordination of mumber of activities, such as proper estimation of credit timely and adequate supply of inputs, repayment arrangements suited to the convenience of farmer, effective machinery for recovery of loans and adequate marketing facilities.

Traditional credit systems are eften unable to meet these requirements of a co-ordinated approach in a modernising agriculture and therefore, necessitate the introduction of a institutional channel of credit.

Although agricultural credit is available through a number of agencies such as Primary Agriculrual Credit Societies (PACs), co-operative Bank, Regional rural Banks and the commercial Banks, the present paper aims at analysing the role of the PACs and regional disparities which emerge thereby.

Primary agricultrual credit societies (PACs) at gross root level serve as the nucleus for the co-operative movement directly providing short and medium term credit to the farmers. Co-operative Credit and Agricultural Development.

In our country, out of all the institutional sources of finance, co-operative finance has been regarded as the most desirable form of institutional credit for agriculture.

This is because, in a country like India, Co-operative movement in general can bring several advantage to the rural society.

The Indian rural society is made up mostly of agriculturist most of whom have very limited resources at their disposal.

From an economic point of view they are all small men of scanty resources, co-operative movement will bring them small men together with a purpose of inducing them to help each other. The co-operative spirit will inculcate a source of mutual help instead of depending on others.

The co-operative movement will also help a great deal to infuse a sense of social conciousness among the rural people, when the capital is joint and co-operative society belongs to them it is expected that they would work together to strenghen their co-operative society and thus, to develop the co-operative movement in general. The creation of the sense of social consciousness is important from the view point of the smooth working of a democratic society.

The co-operative credit is beneficial to the farmers from yet another angle. The resources of the government are made available to the co-operative societies with considerable ease. The liberal credit that the government makes available to the co-operative societies make it possible for those societies to assist the farmers more and in a better way

## Importance of co-operative credit

Among various agencies catering to the credit needs of the cultivators, co-operatives occupy a central place. Nearly 75 percent of farmers own less than two hectares of land and most of them are heavily indebted . It is difficult for them to manage on their own resources for investing in agricultural developments. The flow of credit from the commercial banks despite their large expansion to the agriculture is very inadequate. This leads cultivators take resources to the exploitative grip of private money landers. With expansion of regional rural Banks the grip of money lenders on farmers started petering out though very slowly, still the source dominates the credit scenario in rural India. Its share has declined from 93.6 percent in 1951-52 to 71 percent in 1971-72 to less than 50 percent at present. The only way to free the farmers from the grip of money lenders is through co-operative credit societies since they provide enough credit which is easy, cheap and timely.

Taking inspiration from the success of Raiffiesen's credit societies and on the recommendation of a committee headed by Sir Edward Law early in 1904, the co-operative society Act was passed in India. The Act made provision and laid procedures for setting up of rural credit co-operative by the farmers to deal with their problem of indebtedness. Upto 1951-52 the co-operative however failed to frifit the objective for which they were set up and in 1951-52 their contribution to the total credit requirement of the farmers

was a meagre 3 percent. With the beginning of the planning era; co-operatives made rapid strides and like planning they assumed a Key role in solving the socio economic problems of rural credit in India. It started meeting all kinds of credit needsof the farmers i.e. the short term and medium term credit for reasonal agricultural operations such as purchase of seeds, fertilizers, pump sets, cattle and other agricultural implements and long term credit for purchase of machinery, tractors, tubewells, irrigation channels, permanent inprovement of land and redamption of old debts. The primary objective of co-operative credit is to help the farmers obtain basic inputs in time, sell their produce at good and remunerative price have storage facilities.

## Regional Pattern of Loan Disbursement by PACs

by PACs to marginal farmers, small farmers and landless
labourers during 1985-86. The reveals that during the
year, of the total borrowers 54.49 percent were marginal farmers,
38.62 percent small farmers and 6.89 percent were landless
agricultural labourers. Out of the total loan advanced by PACs
the share of marginal farmers was 36 percent followed by small
farmers(58.60 percent) and landless labourers (5.67 percent).
Of the total loan advanced the share of five states—Kerala
Maharashtra, Punjab, Tamilnadu and Gujarat together is about
(Table-I)
58.25 percent These states received 53.45 percent of the
total credit advanced to marginal farmers 58.88 percent of
the small farmers and 64.57 percent of the landless agriculture

labourers on the other hand there are some states which are big both in respect of area and population but got only a small proportion of the lean advanced by PACs. For example Bihar, West Bengal, Madhya Pradesh taken together received only 8.16 percent of the total loan advanced. Their share of the loans to marginal farmers, small farmers and landless agricultural labourers workout to 7.9 percent, 8.12 percent and 3.20 percent respectively. The success of PACs limited to a few states while the most needy states like Bihar and Madhya Pradesh which are totally agricultural states, the co-operative credit is not playing the desired role. The limited success in these states may partially/attributed to a very high percentate of loans outstanding to loan advanced which is as high as 237 percent in Bihar, 236 percent in West Bengal and 158 percent in Madhya Pradesh.

## Patterns of Borrowing among the Members of PACs

Table 2 clearly reveals that wide fluctuations exist among the states as far as percentage of borrowers to total membership in PACs is concerned. Haryana, Karnataka and Orissa have the lowest percentage of around 16 to 17 percent. The next group comparies of States where the percentage share fluctuates between 20-25 percent. As many as 5 states fall in this category. Finally we come to the high percentage share states such as Gujarat (39.66 percent), Kerala (48.67) and Punjab (61.51 percent) in 1985-86 when we look at these percentages within the states between 1981-82 and 1985-86 most of the states do not show much variations. However,

there are some states where the variation is quite marked.

Bihar is the most striking state where the percentage of

borrowers to total membership of PACs has declined from around

48 percent in 1981-82 to 20.43 percent in 1985-86. Tamilnadu

shows a decline from 44.65 perfent to 25.41 percent during the same period. Rajasthan and Uttar Pradesh also depict a declining trend although to a lower extent. Kerala on the contrary shows an increasing trend with the percentage going up from 34.73 percent in 1981-82 to 48.67 percent in 2985-86. The very slow growth in the proportion of the borrowing members in the last decade, and the some states a net decline in the same is a phenomenon which seems to transcend to some extent the internal weakness of the co-operatives. Undoubtedly, the high deliquency rate of recovery of loans has depressed the growth of borrowing members and will continue to so affect it till the channels of credit recycling are unlogged by better recovery performance.

## Pattern of per hectare loan disbersement by PACs

As was the case with the borrowers the loan issued per hectare of gross cropped area also registered wide disparities among the different states. In 1975-76 loan per hectare of gross cropped area was very small amount in all the states. In only four states it exceeded Rs.10 and Kerala was first placed with a loan of Rs.16.41 per hectare. In as many as 6 states loan per hectare was below Rs. 5. By 1985-86 some improvement in loan per ha had been more but inter state disparities have apprently widened. On the one extrem

we have Bihar with a per hectare loan ofonly Rs. 31.63. Another three states namely Orissa, Rajasthan and West Bengal have a loan of less than Rs. 100 per ha. on the other extreem we have Kerala where the per ha. loan stood at Rs. 1294. Thereby maintaining its top position Punjab is second placed with Rs. 524.30 and is followed by Haryana (Rs. 364.32), TamilNadu (Rs. 363.31). These are the four states which had the higher share even in 1975-76 with the exception of Haryana (Table 2). Although the above average have been arrived at by dividing the total loans given by PACs by the gross cropped area in the state, whether all the members were borrowers or not, it all the same shows that loan per ha issued in most of the states were very low even against the background of considerable increase in the scale of financing during 10 years period. The scales of crop loan per ha for principal crop fixed often on adhoc basis ranged between Rs. 1000 to Rs. 3000 per ha. only Kerala and Punjab have issued some what reasonable amount per ha. but in all other states the gap in credit requirement to actual loan advanced continues to very wide.

## Conclusion

It may be said that despite the fact that the co-operative societies can play a very vital role in the process of agricultural development, they have appearntly not been taken as seriously by the agriculturist as is desired. The co-operatives can work efficiently and successfully only when people are fully aware not only about their role but also the role which they themselves have to play by way of timely

repayment. Whenever, people have failed to co-operate in the smooth functioning of these societies we observe that the share of total cultivators taking loans have been rather low. As a consequence the amount of loan too has been low. On the contrary states where the level of education is high (Kerala) or where the farmers are progressive (Punjab), these societies have been functioning quite efficiently and effectively. is primarily the reason why large scale disparities are evident in co-operative credit. It is, therefore, essential that these societies should not simply play a passive role in extanding credit facilities but should take the responsibility of educating the masses about the society and on the need to repay the loans on a timely basis rather than be a party to only the beneficial aspects like receiving easy loans on a timely basis and at cheap rates of interest. The people should be strongly discouraged in taking loans for non-productive purposes. On of the reasons for the default in repayment has been that many time a loan, although taken for agricultural purposes, is put to non productive use. Thus the co-operatives should also devise ways to monitor their schames and ensure that they are being utilized for only that particular purpose for which it was originally sanctioned.

TABLE - I

STATEWISE ADVANCES TO FARMERS BY PRIMARY AGRICULTURAL CREDIT

SOCIETKES (PACs) DURING 1985-86 (JULY-JUNE)

States	No. of	Loan	Loan
	borrowers	Advanced	Outstan-
	(in 000)	(%. •r.)	ding(Rs,cr)
Andhra Pradesh	1755	22308	31825
	(9 <b>.</b> 55)	(7.60)	(7.55)
Bihar	1121	2730	6470
	(6.10)	(0.93)	(1.54)
Gujarat	919	25906	37818
	(5.00)	(8.83)	(8.97)
Haryana	693	13494	18011
	(3.77)	(4.60)	(4.27)
Karnataka	666	19 287	28000
	(3.63)	(6.57)	(6.64)
Keral a	2561	500 36	51401
	( <b>1</b> 3.94)	(17.04)	(12.19)
Madhya Pradesh	1361	16432	26187
	(7.42)	(5.60)	(6.21)
Maharashtra	1707	41888	64401
	(9, 29)	(14.27)	(15 <sub>•</sub> 28)
Orissa	589	5794	17439
	(3.22)	(1,97)	(4.14)
<b>P</b> unjab	1051	32175	25258
	(5.72)	(10.96)	(5 <b>.</b> 97)
Rajasthan	1435	15603	26738
	(7 <b>.</b> 81)	(5.32)	(6.34)
Tamil Nadu	1113	18059	35970
	(6.06)	(6.15)	(8,53)
Uttar Pradesh	2903	25038	40795
	(15 <sub>•</sub> 81)	(8.53)	(9.69)
West Bengal	492	4780	11289
	(2,68)	(1,63)	(2,68)
All India	18366	293530	421602
	(1 <b>(</b> ^_,^0)	(100.00)	(100.0 <b>0</b>

source: Report on currency and Finance, RBI, 1987-88 Part I P.64 Figures in the Parentheses show percentage.

TABLE-2

Percentage of Loan Receivers to Total Members of PACs and Loan issued per hectare of Gross Cropped Area.

States	Percentage of Borrowers Loan issued per hectare to total members of gross cropped area (Rs.)			
	1981-82	2985-86	1975-76	1985-86
Andhra Pradesh	20.60	23.88	5.48	173.09
Bihar	48.02	20.43	3.14	31,63
Gujarat	38.37	39.66	12.72	280.86
Haryana	17.44	16,93	7.65	364.31
Karnataka	16.50	15.99	7.11	138.47
Kerala	34.73	48.67	16.41	1294,16
Madhya Pradesh	32.96	28.27	3,07	119.64
Maharashtra	27.87	25.58	8.04	173.92
Orissa	25.92	17.15	2.16	60.58
Punjab	60.24	61,51	10.74	524.30
Rajasthan	41.53	33,46	3.16	82 <b>.</b> 57
Tamilnadu	44,65	25.41	14.80	363,31
Uttar Pradesh	33.55	21, 25	, 3.79	107.88
West Bengal	30.53	21.25	2.71	93,54
All India	32,48	27.26	N.A.	N. A.

Source: A Review of the Agricultural credit system in India, Reserve Bank of India, Bombay.



# RECTONAL DISPARITIES IN DEVELOPMENT AND DIFFERENCES IN FACTOR ENDOWMENTS - A CASE STUDY OF KERALA

## K.A. Suresh\*

The degree of development and subsequent results beed not necessarily be the uniform in all parts of the economy. But the consequences are grave if it remains as such for 4 long time, especially in an ora of increasing disintegration under the pretext of accomic inequalities or other excuses. In order to remedy such imbalances, what is required at first is to seemerk the less developed areas from more developed and identify the rescons behind then for speedy remedial measures, with such a view in mind, the present paper attempts to identify the recipael disparities in development of Kerals which is one of the emellest states in India with the highest Physical Quality of Life Index (POLI). The paper is designed in six pasts vis. A) methodology of the study, b) disparities in historical region, c) disparities in administrative regions, d) role of factor endowments, e) best (adjector of disparity and f) conclusion.

## .1 Methodology of the Study

The mejor objectives of the study are the followings.

- 1) To know that whether there exists disparities in development emong different regions in Kerala.
- 11) To find out the relation of regional disparities with factor endowments.

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111) to solect a relatively better indicator of disparity.

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State was divided into historical and administrative regions on the besis of corresponding norms. Development was defined in terms of State Demontic Product (SDP). Development variables were standardized by parametes share method. Peirod tetest was used to know the significance in disparities. The degrees of correlation between income and factor endoments were found by resource index method, rank correlation and multiple regression. The Speamen's Rank Correlation was used to identify the best indicator of disparity.

## 2. Pieparities in Historical Regions

. F C .

Mistorically the state was divided into Travancaso.

Cochin and Maleber regions under different princely provinces.

In the present analysis due to the nature of data available.

Travancere-Cochin regions are clubed together. The areas

are contiquous from South to North. At present Travancere
Cochin region consists of eight revenue districts from

Trivendrum to Tricher and Maleber region with other districts

from Palghat to Kasarapod. There is a widespread feeling

that Maleber region is neglected historically and Travancere
Cochin region is advanced relatively. By taking the SDP of

these regions for the lest 17 years from 1970 to 1987, degree of disperity and its variation over the years and enalysed.

The everage SIF of Travencore-Cochin region was always greater them that of the Helsber region during the entire study paried except for three years. It shows that the former region is more developed than the latter region.

The period t-tast for mean deviation in income (SDP) of both regions showed that the difference is statistically significant et five per cent level with a t-value of 2.777. But the t-value (1.66) is found not significant during the first phase (1970-78). Hence it implies that disperity has developed in the later period (1979-87).

#### 3. <u>Disperities in Administrative Region</u>

The administrative region is defined in terms of revenue districts. The State of Kerala consists of 14 districts of varying years of origin from 1956 to 1985. The SDP of eight districts are below the state average and hence less developed. About 50 per cent of the districts in Travancore-Cochin region and 67 per cent of Malabar region are less developed. The available data for 14 districts from 1985-86 to 1987-88 show that there is maither any change in the percentage composition of less developed districts in both

regions but also the same districts happen to be the victims throughout the paried. A study with 11 districts in 1970-71 also reiterates that the districts which were underdeveloped two decades are still under the same state of affairs. It shows that the imbalances were neighter noticed nor my effective stamps was made to rectify them.

### 4. Rola of Festor Incorrents

Factor endaments in each region are very crucial in determining the degree of development and possible disperition. Remailly, higher the endowments, higher will be the development. Put it does not imply that equal level of endowments ensures aqual rate of growth, obviously due to differences in dynamics of development. The relation of certain development variables with income as the index of development is given in Table 1.

Table 1. Cassalation of SDF with Development Variables

51. Nos	Development Veriebles	Correle- tion	T-Value
1. 2. 3. 4. 5. 6. 7.	Industrial Enterprises  Road Length  Educational Institutions  Medical Institutions  Population  Cropped Area  Financial Institutions  Loans Disbursed	0.456 0.494 0.627° 0.773** 0.855** 0.885** 0.884**	0.822 0.497 0.011 1.078 1.905 0.903 0.196 3.190**

Note: Significant at \*\*1% level, \*5% level.

As per Table 1 six variables are positively correlated with the level of income. Analysis of variance showed that 96 per cent of variation in income is explained by the variables taken (R-square = 0.9593). But the t-value (3.190) is significant only in the case of amount of loans disbursed.

enelysis is further elaborated. The intention is to know that how far the distribution of factor endowments and degree of development are related. Analysis is made with respect to Malabar which is found to be the less developed region. The share of Malabar region in total factor endowments is calculated at first (share of other region is the balance). This proportion will not be normally equal to Travancore-Cochin region. Based on the availability of data, we presume that factor endowments should be equal to the proportion of population in each region. Aggregate sverege difference with population ratio is the basis of relative resource index. Table 2 shows the proportion of factor endowments in Halabar region which can be used to formulate a relative resource index.

As per Table 2, of the 26 variables, eight variables have a ratio more than population ratio, 17 variables have a lower ratio and equal ratio in the case of population.

Compared to population Malaber region is less endowed in 17

Table 2. Factor Proportions in Malaber Regions, 1986-87

sl. No.	Teotors.	Percen- tage shake	51. No.	Pectors	Percent- ege shere
1.6	Cropped area	44.94	14.	Organised Equipment	32.39
24	Population	39.48	15.	XIC Loss	25,89
3.	Literates	35.60	16.	Own House	37.44
	Vorkers	38.67		Road	34.34
			18.	Motor vehicle	e 28.61
5.	Annual Rainfall	37.51	19.	Post Office	40.44
6.	Cropped Area	43.55	20.	Educational institutions	45.05
7.	Vertiliser consumption	<b>40.</b> 53	21.	Medical Institutions	32,89
8.	Irrigated Area	45.50	32.	Financial institutions	31.72
9.	Agricultural Implementa	36.07	23.	Institutional credit	29,06
10.	Livestoet/roultry	38,02	24.	Ration card	37,25
	Registered	39.95	25.	Electricity consumpre	26,78
,	rectories	**************************************	26.	Reilwey line	51.93
12.	Emell Scale Industries	34.03			
13.	Hendlock/Indus-	37.38			4 Tr

Bourca: Compiled from Department of Economics and Statistics, Statistics for Planning, 1988.

variables to the tune of 5.2 percentage on an average and excess resources to the tune of 4.52 percentage in eight variables. By adding the excess and shortage, we shall see that Malebar region has lower share of resources to the extent

of 1.30 per cont. But in the case of Travencore-Creaks region, they have 1.86 percentage where of resources note than their there of population. Therefore, it can be very well inferred that difference in the degree of development is explicitly expressed in difference in factor endowments. The Spearmans Rank Correlation between rank on 50% of calculation strative regions and chair/resource endowments also character they are highly correlated with a positive correlation value of 0.677 (See Table 3). Thus one of the major reasons for the backwardness of Malabar region is, of course, the latter level of natural and man made resources in their area.

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Table 3. Renks in Development and Resources, 1956-67

Sl. No.	Nome of Districts	Renka in	Ronko in PCZ	icono in Locultose
1.	Travellan	02	07	6.8
i.	outlon " notion	05	<b>G</b> O	90
3.	Pathananini ta	17	<b>66</b> 0 /	11
4.	Alleppoy	07	21	30
5.	Kotteyen	09	06	09
6.	Xdukki	11	02	-12
7.	Esnakul m	01	01	01
0,	Trichuz	04	12	03
9.	Pelghat	08	13	66
10.	Helappuran	10	30	67
	Kozhikode	03	05	CO CO
12.	Wayenad	14	02	2.0
	Cannoor	. 06	20	fā
14.	Kasaranode	13	04	23

### 5. Sector Indicator of Dieserkty

best indicator to measure development disparity? We had seen that development and factor endowments are directly roboted. Hence at first we ranked administrative regions (districts) in order of their degree of development on the basis of both SDP and PCI. These ranks were related to their ranks in factor endowments. The ranks in factor endowments were calculated by finding ranks of 14 districts in 26 variables at first which were added and divided by 26. It was taken as the resource rank of each district. The variable which accord highest rank correlation between developed and resource ranks will be selected as the best indicator to measure disparity. Table 3 shows ranks in development and resource andowments.

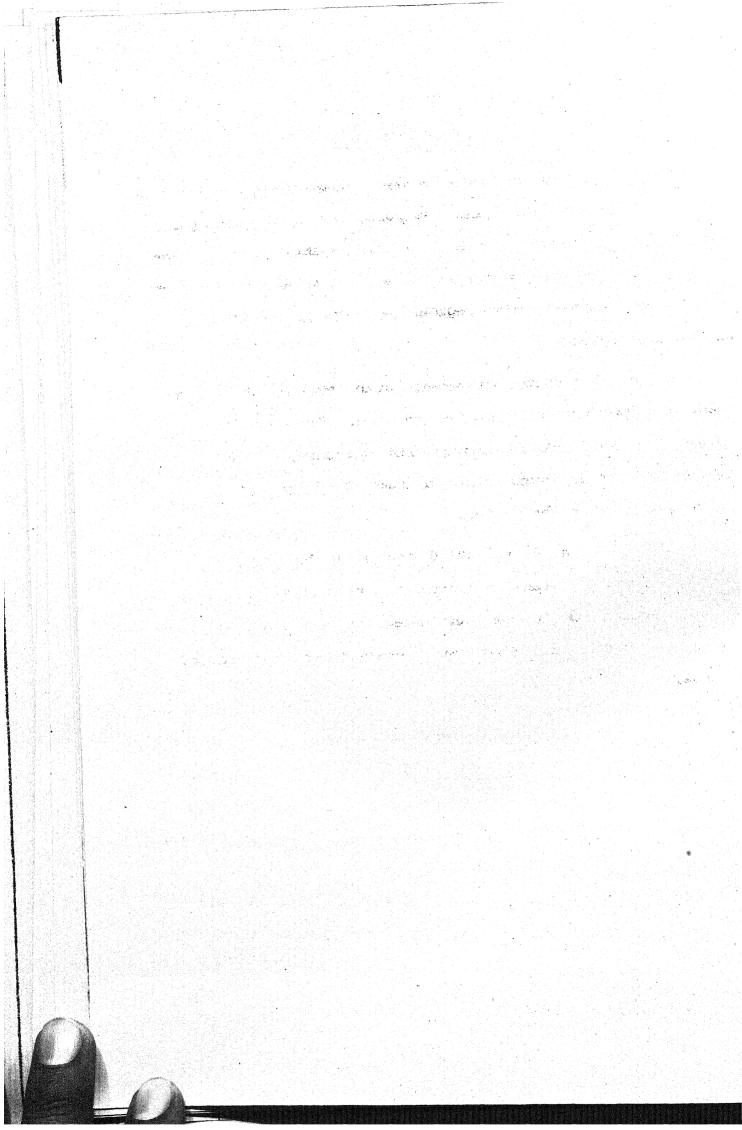
The Speasmank and correlations of SDF and PCI with resource endowments are 0.877 and 0.275 respectively. Since the highest correlation is with SDF, it can be concluded that SDF is the best indicator to measure disparity in development emong administrative regions than PCI.

## 6. Conclusions

The enalysis of disparities in development with respect to historical and administrative regions showed that there exists not only significant level of disparity but also its increasing degree in the later years. Undeveloped districts are uniformly the same throughout the period of study which points out the lapses of planners to identify the imbalances and lack of effective measures to rectify them. It is also found that undeveloped administrative regions are more in undeveloped historical regions.

By relating factor endowments with development, it is observed that they are highly correlated. The less developed regions are found poorly endowed with resources. Among the EDP and PCI, it is found better to take the former to measure the disparity than the latter.

The existence of regional disparity in development and casual attitude of planners towards it are serious crimes. What is required is diligent and immediate state intervention. And here we have a case where such intervention is warranted urgently.



## PACTERNS AND CHANGES IN SPATIAL IMPALANCES IN INDIA

Bipul Malakar and Jayatri (Deb Chaudhury) Basu\*

The general notion of economic growth — a desired objective of every nation, implies a sustained increase in the total and per capits product of a nation. It is visualised that as a consequence of growth, there occurs significant structural changes. Though with development, regional impelondes, as a structural phenomenon, are widening in many third world countries they have yet to get prominence in the literature. For a speedy development, (by planning or otherwise) in the initial stages of growth, balanced regional development is deferred to the long run. But the experiences of most developing nations show that, with no perceptible sign of convergence in the next future, disparities are continuing to persist even in the long run.

Ine widening in the regional imbalances during the initial stages is understood to be an uncontrollable phenomenon. However, this would have its repercussions on the mode of national and inter-regional development in the coming years. It becomes imperative, therefore, to interpene in the process of economic growth by specifying the national objectives to cope with incompatibility of individual objectives in order to influence the emerging apatial gaps.

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Regarding regional imbalances in India, S. Chakravarti<sup>1</sup> has opined, "that this (regional, imbalances) happened to a certain extent cannot be decied. "An accentuation in the interregional disparities has also been noticed by many others. It appears that Indian planners could not lay any serious thought to this problem of widebing regional imbalances in the initial stages of planned development. The primary objective of plannering was to attain growth.

Development was sought through industrialisation. At a much later period, at the time of formulating the Fifth Plan (1974 - 1979) it was realised that attention can no longer be deterred.

Among various policies it was thought, once the economy registers a higher rate of desired growth, which unfortunately is rurely achieved, some kind of trickling down phenomenon was implicitly assumed to emerge automatically to tack the resulting regional impalances in the foture.

Largely, the policies followed by the Indian planners and policy makers regarding the regional aspect was to increase the economic and social overhead capital so that backward areas become suitable for industrial location - industrialisation primarily and some breakthrough in agricultural production

structure, was sought to be a path towards development. However, certain loopholes, for e.g. political elements in the decision making process regarding the location of industrial projects; inadequate investment in research and extension activities mainly regarding agricultural development etc. stood in the way of checking the regional development process.

It has been observed that it is not really possible to achieve a high rate of growth and justice simultaneously. A balance between the two is required. Frank, J.B. Stilwell observes that "trade-offs between inter-regional equity and aggregate efficiency are involved in a variety of decisions."

These general views are also echoed by Dandekar when he points out that, in keeping with the problems of a developing country like India, there occurs a spurt in regional disparities, with the process of development. He, however, stresses more on an increase in 'inequality in the distribution of personal income' with growth. Dandekar's view on regional imbalance has been possessed also by many others. They, however, have mostly failed to visualise that such type of distributional manifestation is embodied in the planning process itself.

In addition, sevings in particular and other institutions factors in general, have also influenced the growth pattern. With the understanding, in the theoretical plane that lack of

domestic resources in the form of domestic savings, in a major obstacle to attain the desired rate of growth, influencing the rate of savings was one of the primary policies options in Indian planning. It is well knows that only the saturated and nder saturated consumers can possibly think of increasing savings. The process of reaching out to the resources from the vest tural areas, predominantly agricultural (low productive) in rature, to the urban industrialised sectors, thereby causing a spurt in rural arban differentials, was helped by this phenomenon, premumably indirectly if not directly. It is not necessary that such transfer of resources will only accentuate intra-regional impalarous within the provincial boundary. On the contrary, flow would also, generally cross the provincial boundaries in the absence of strong institutional intervention. It is well-known that financial institutions, theoretically play an important role in stimulating development in packward areas. But in the absence of strong financial regulation for the flow of funds at least in the initial years, the resource transfers have been normally flowing from less potential to the potential areas, consequently, sidening regional gaps.

The emphasis on infrastructure and the heavy and captual intensive industries. They're naturally a leaser degree of regional spread) will obviously contribute towards the varying process of industrialisation - consequently leading to an

increase in regional disperities. No matter what our planning policy has been, the attainment of about 2.5% rate of growth has been echoed by many as concucive to better performance in the long ron.

## Section - II

Our study, latends to inventigate mainly, the pattern of regional growth and movements of regional imbalance i.e. the distribution of economic growth and development achieved by the Indian economy foring the last decades of planning and the change in the distribution across the regions with the overall movement of the national economy. This study utilizes the State Domestic Froduct (SDP) as an indicator of growth and development. They appear to be adequate acasures since the states can be treated as semi-independent spatial units - the Indian provincial authority within the federal structure enjoys some subscenary and there is independent demand for greater outcomy to provinces from all forems of citizens.

prove to be useful in ascessing the regional dispersion and degree of regional spread of economic growth and development. The degree of success achieved in consequence to the overall planned objectives of drowth may also be judged by the november of SDP. They also prove to be important indicators, for determining programmes

for a balanced regional development by the Planning Commission.

SDP measures have been used widely by many economists like M.

Mukhorjes, V.K.R.V. Rap. R.H. Dholakia atc. for studying the mature of regional growth and development.

Estimates of State Pomentic Product (SDP) :

The CEC compiles and publishes two sets of estimates of SDP - the comparable series (CE) and the state series (SS). The estimates of state series are prepared by the individual states and supplied to the CSO. On the other hand the comparable neries is prepared by the CSO in terms of value added following a uniform procedure for all states.

The comparable series is available only at curpout prices.
This series is usefu' for inter-state comparisons only at a point of time.

estimation procedure - the income originating method. But they differ with respect to coverence. If we take SDP to represent the teste dimestic product, Y and Y to represent state series and comparable series estimates of state domestic product respectively, and let AC and AC are income originating from left out activities of the state series and comparable series.

 $SDP = Y_g + AC_g + (inflows - cottlows)$ and  $SDP = Y_c + AC_c + (inflows - cutflows).$ Then  $Y_g + AC_g = Y_c + AC_c$ 

The difference in the values of Y and Y will depend on AC and AC, that is, differences in coverage. One needs to be cautious here since the above formulation will hold only if inflows and outflows of both the series are equal (which is implicitly assumed here).

#### Section - III

## Regional disparities :-

At any point of time the nature of regional disparities may be understood from the distribution of FCSDP with Indian per capita national income as numerore. The change in the distribution over time obviously focuses on the direction of the movement of regional imbalances. From Table 1:1 we notice, throughout the period (1950-61 to 1984 -85), Maharashtra, Punjab, Haryana, Gujarat, West Bengal and Rimachal Pradesh have experienced a higher level of PCSDP compared to the national average, while Assam, Fihar, Kerala, Madhya Pradesh, Manipur, Oriasa, Rajasthan, Uttar Pradesh and Tripura had their level of PCSDP ALWAYS BELOW THE RATIONAL LEVEL. The above picture is observed in both current and constant prices and in terms of state series

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and comparable paries. On the other hand Andhra Predech protrayed a fluctuating trend. The quickpennial average indicates that in most of the periods the level of ECSDE was below the national average. According to the estimates of comparable series, Japan and Kashmar and Kashmarake scald deprove their relative position in terms of PCODE - registered a higher level of ECSDE in comparison to the national average. The most disappointing picture is observed in case of Tanai dalu - started with a higher level of FCSDE (comparable series) then faced a methods - FCSDE during the last quinquencial period was below the national average. The above picture clearly indicates some stagmancy in the distribution of mational according expansion across the states.

between - part of rational income originating from the states enjoying FCSDP bigher than the national average and that of part of national income according to states experiencing per capata level of SDP below the national average, could indicate the movement in the regional imbalances. Pros column 4 of Table 1.2, it appears that the share of states in NNP telorging to the below average class have witnessed some increase over time in both nominal and real terms. From the first quinquential period the share improved from around 45% to 50%. This impressed trend in the share of this below average class may be interpreted as an indication of better distriction of NNP with time clearly

auggesting additional NNP generated favoured the less developed ereas. Over time the coverage in terms of percentage
of NNP (Colomn 2, Table 1-2) increased. However it
appears to have to influence in the percentage share of below
average states in NNP - the observed temporal correlation
between them was low obviously attemptions the above findings.

The disturbing feature is with state series constant price figures - indicating change in the opposite direction; the decreased share Of below average states in NIP needs explanation.

ted inversely with the percentage share of below average states in MMP and with the percentage share of population in below average states as well. One, therefore, need he castious to interpret the decreasing share of below average states over time. The nature of regional disbalance can readily be understood from the fact that hearly 70% of the population are still residing in the backward regions according to this series. This obviously is not suggestive of a healthy state of affairs.

The movement of the ratio of the PCSDF of the state having maximum to the state having lowest PCSDP over the years (Table 1.3 ) may be looked upon as a sign of convergence/divergence in the spatial spread of development. In constant

prices the ratio has registered an upward movement in both the comparable and state series, indicating an unfavourable trend. The increase in spatial inequality deems to have widered after the seventies. In current prices, the ratio indicates that the divergence in FCI was less promounced. The trend line fitted to these ratios support the above findings. Estimated intercept parameters are observed to be significantly different from one even at 0.5% level of significance and the estimated slope is also significantly different from sero, (estimated parameters of the trend line are given at the bottom of table 1.3).

An examination of the co-afficient of variation(presents) in Table 1.4) does not alter our above fundings. The general tendency of increasing divergence across regions can readily be observed because the estimated alops co-efficient of the linear trend line fitted to the co-difficient of variation data exhibits a positive sign. We are therefore, not in a position to visualise the long term effect of growth policies in neutralising the aneven nature of economic activities across the states.

there was an increase in the regional inequality. It is obvious that the necessary and sufficient condition for the PCI to register at accelerated rate of growth is that the rate of growth of population needs to be below the rate of growth of SDP. Thus it is imperative to judge the spatial distribution of SDP growth

and also compare the growth of economic activities with the spatial nature of population distribution. In process to carry out the above investigation it is prefogative for up to make use of the state series figures.

A posiceable feature is that the bulk of the population lies in the low level PCEDP class, experiencing also a low level of growth of PCEDP and SDP. This phenosenon is, however, evident considering the fact that most of the states lying in this class, viz. U.P., M.P., Bihar, Orises, Tamil Radu and Kerala, share a large part of the total population of the country, (about 19% of the population on the other hand, the next highest concentration of population is observed in the class with growth rates of PCEDP and SDP above the all India average.

Most of the provinces belonging to this class have PCSDP above all India average PCZ. Unfortunately unid class sculd not boast of a high percentage of the country's population. The number of provinces belonging to this area being comparatively low. The percentage of population, residing in the class with above average growth rates of PCSDP and SDP but the level of PCSDP below average, is low. This is again justified by considering the fact that most, of the few states lying in this class, belong to the north-eastern region where the density of population is not very high. This phenomenon also indicates that this region is gradually improving its performance which may be attributed

to the planning process striving to decrease the routial disparities. But a disheartening feature is that the percentage of population in the class experiencing los growth rates of MISOP and SDP, inspite of enjoying a level of PCSDP above average. Is bigher than the afore mentioned class. This may be explained by the fact that West Bengal, lying in this class comprises of a high population level (3:1% of the Indian population approx). Thus a small percentage of the population derives most of the benefits of economic expansion while a large part still lives in because conditions.

the current price figures show that the states with a low level of PCSDP have a growth rate below the all India level and those with above average levels of PCSDP have experienced a growth rate above the all India level. However, the exceptions are those of West Bergal, Himschal Pradesh and Karnataka - they have failed to cross the all India growth rate inspite of epicyling an above average level of PCSDP. On the other hand Jampo and Kashmir, Assam, Manipur and Aromachat Pradesh present unusual pictures by showing growth rates above the all India level while their PCSDP levels are yet to register considerable improvement. Tripura also experienced an above average growth rate inspite of registering below average levels of PCSDP. There has been a retardation in the PCSDP aporth into of Horysha while Sihar, Himschal Pradesh, Tamil Nadu and West Bergal have registered.

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decline whereas Bihar, Tamil Made and Mest Bengal have improved their growth rates.

The cictors with respect to constant belows is almost similar the spatial differences in prices did not have any significant effect. Here too, almost all the provinces with a Itw level of PCSDP have also registered a growth rate below the all Italia growth rate. On the other hand states with an above average level of PCSDF have grown at a rate above the all-India level. However, there are some exceptions, Arungchal Prade sh. Jambu and Rushmir, Manibur and Tripura along with Assum and Rejusthan have been able to attain a growth rate above the all India level even though their PISDP levels are below gretage. In the case of West Dengal and Gujurat the growth rate fails to be above the all India level implie of there states enjoying an above average Level of PCSOP. It may be mentioned that textiles and the traditional metal based engineering goods industries are on a declining brend in India and the two important bages for these industries are Gujarat and West Peogal. Low growth in these two provinces at least partially may be sttributed to the above feature.

However, a preinceworthy lesture is that some provinces are showing a sign of recovery by witnessing an improvement

in their decadni provin rates to above the all India level -

Table (1.5) below encous the relation between the growth rates of PCSDP and SDF on one hand and the level of PCSDF on the other.

One can vigualize eight classes.

At current prices it is seen that the provinces with a low level of PCSDP have also registered a low growth rate of PCSDP and those with an above average level of PCSDP have also experienced a high growth rate of PCspP. The table purrays that buly 3 states (Gujarut, Maryom and Maharashtra) belong to the class with growth rates of FCSDF and SDP above average courled with a level of FCBDF above average. This is the most fortunate area. A bulk of the states, 8 in number, fell in the class with is low growth rate of PCLDP and SEF together with a low level of PCSOP - this is the most discouraging picture. Only Tripura in this class registers a growth rate of SDP above average but the growth rate and level of PCEDP are below average. Probably population has played a role in slowing down the PCSDP growth rate in this state. An empouraging feature is that 3 states lie in the class registering growth rates of MSDF and SDF above average inspite of the level of FCSDP being below average. Beyond any doubt the planning process has helped these states to improve

their relative position to accein an above average lavel of PCI growth rate. A clear suggestion, therefore, comes out that teck-line regional disparity in the graven rates, in the long run, is not altogether an impossible tack.

However, if equity in the distribution of PCSDP is our ultimate objective, no matter how it is attained, one may derive some kind of complanency from the fact that at least three provincer (West Rengal, Himachal Praisen and Karnataka) enjoying the status of higher PCSDP has witnessed their rates of growth of SDP and PCSDP to decline. In what follows, this fact suggests some changes in the spatial structure of model - faster growing, regions. It should not, however, be interpreted that the configuration of polarisation or pooling of resources has undergone a complete change. The ornation of intrastructural facilities have, to a large extent, helped in inducing germination of mescent polarised centres. Hopefully we may experience a favourable outcome of this endeavour.

favourable modification in terms of constant price series.

Leoner number of provinces are classified in the eropomically backward region in terms of growth rake of SDP and PCSDP. The encouraging picture is that most of the state; in this group baye experienced a high level of growth - compared to all India

average growth. It would not be, therefore, unrealistic to conclude that spatial discrepancy in the prices has contributed favourably, the economically backward regions.

constant prices. It is apparently clear that, not all provinces could take advantage from the difference in the existing spatial price and both economically backward and relatively advanced regions show some differences bithin themselves. For example, Gujarat faded an adverse adject of prices - at current prices it was in the places with above average growth rates of SDP and PCSDP and also an above average level of PCSDP but at constant prices seved down to the class with below average level of structure of SDP and of structure prices according to the class with entry effect - at correct prices it was in the class with growth of SDP and PCSDP below average along with the level of PCSDP below average whereas at constant prices it moved up to the class with growth rates of SDP above average.

relation may exist between the price change and growth. That economic growth in ledia has been accompanied by higher rate of inflation in a foregone porclusion, specially more efter the plan helidays i.e. the Fourth Pian onwards. The issue - interconnection between inflation and growth, is however controversial in the literature.

In India, we noticed that there exists considerable variation across the provinces in both growth rates and prices. This difference in the growth and spatial prices may be exploited to examine the interconnection between growth and inflation in the first place and also identify the role of spatial differences in prices as a consulton of inter-state variations and continuation of inequality.

For investigating the inter connection between rate of inflation (measured by implicit price deflators of SDP) and growth, the empirical evidence is summarised in a two way table (1.6).

Growth rate is measured separately by growth rates of SDF and PCSDP. From the table No. definite suggestion comes out regarding the especiation between infinition and growth. If inflation leads to growth then the states are expected to be concentrated diagonally across the table. But this has not been the case.

Thus, we may conclude that there exists no inter-connects between growth and inflation. In India, one may also find reasons to believe that, muttal differences in prices and economic growth are apparently two disjoined phenomena.

#### Concluding remarks :-

provinces are still realing in backwardness. Apart from the encouraging fact that the part of national income, coming from the states falling is the balow average level of PC1 group, have been increasing over the years, it is seen that the increasing trend of inequality has shown no perceptible sign of convergence - the undestrable phenomenon of a divergence across regions has occurred instead. In addition, the differential growth rates of the regions have helped only a small percentage of the population to derive maximum benefits. leaving a substantial part of the people under uniquourable conditions.

expectations in bringing about a more equivable spatial transformation of the economy. There are states which were developed
(in the sense that their foods was above the average level) but
could not achieve a high growth rate. However, the preiseworthy
feature is that some states which were not very well off in the
initial period, surprisingly registered above average level of
growth rates. It is also noticed that there is hardly any connection between spatial price differences and growth rates.

It is believed that in the imitial stages of development, a dertain amount of justice beeds to be foregons in order to echieve higher growth, in the hope of balanced conditions in future. But planning in India, which gradually showed concern for a balanced regional development, does not seem to have succeeded much in bridging the spatial gaps. After tearly four decades of planning there has been no perceptible sign of convergence in imbalance — a fact which calls for serious concern. In order to prevent further accentuation in regional imbalances — posing remove threat to political and economic integration of the country, it is imperative that policy measures need be assomitiated with the spatial aspect of investment pattern, industrial structure, production mixture etc. etc.

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1970-71			2.71	2.74
1974-75	2.68	2.05	2.64	2.39
980-81	3.20	2.97	3.07	2.78
984-85	3.41	2.70	3,40	<b>2.59</b>
istimated Slope Parameter	0.408	ō ; e5,	() <b>, O</b> ()	0,02
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1966-47		Profesional (1995)	25%	224
1967-66	10%	10.	2.5%	23%
1968-69		21%	27%	25%
1969-70		2%	20%	15%
1970-71		244	10%	2.0%
1971-72	20%	23%	29%	28%
1972-73	<b>:0</b> .	10%	28%	<b>2%</b>
1973-74	18%	29%	79%	21th _d
1974-75	<b>27%</b>	244	19%	214
1975-76	26%	26%	30%	29%
1976-77	314	3 <b>%</b>	33%	33%
1977-78	11%	11%	31%	31%
1978-79	17%	31%	33%	324
1979-80	10%	324	36%	34%
1980-81	346	30%	22%	29%
1981-82	33%	10%	36%	29%
1981-03	36%	39%	40.	29% N
1983-64	124	27%	JIK.	26%
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## INDLE 1.5

Relation between growth rates of FCSDP and SDP and the level of FCSDP.

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PATTERN OF DEVELOPMENT AND CHANGE INTER-STATE ANALYSIS

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# PATTERN OF DEVELOPMENT AND CHANGE IN INDIAN AGRICULTURE : AN INTER-STATE ANALYSIS

B.K. Bajpai\*

The basic objective of the present study is to present the pattern of agricultural development and its impact on different regions in India. It is considered important in the sense that still agriculture is the backbone of national economy. development of the sectors of economy namely, secondary tertiary is contingent upon agricultural development. The study follows the hypothesis that regional disparities of agricultural development in India were created during colonial In post-independence period the emphasis on planning economic efficiency exaggerated the old colonial disparities and created the problem of regional duality that has become a pressing problem in present time. The whole analysis is organised in three sequential parts. The first part presents the pattern of technological changes after independence in Indian agriculture. Second part takes into account the agricultural development of post-independence period till the time of Green Revolution and the third part deals with agricultural development policy and strategy after Green Revolution.

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## PATTERN OF TECHNOLOGICAL CHANGE

An increase in production may be due to increase in under cultivation or productivity increase or may be both. it is due to increase in area, it implies generally traditional approach to agricultural activity which brings about change in production but not in 'relations of production'. Even if this increase is due to irrigation expansion, it may not be different than the traditional approach, unless irrigation expansion itself is non-traditional like wide-spread use of power, for left irrigation or canal irrigation in areas where either no irrigation and or non-canal surface there was irrigation and or lift irrigation using traditional technology. The technology which makes a break from traditional technology offers the basis for increase in the level of consciousness of those engaged in agricultural activities and thus, dynamises the process of change in the relations of production.

The increased surplus that came in the hands of agriculturists after independence led to icreased agricultural production and productivity almost on traditional lines. This hardly brought about a change in relations of production. The use of fertilizer is a step forward in the direction of technological improvement and the use of fertilizers, pesticides and High Yielding Veriety of seeds is a break through so far technology in agricultural sector is concerned. This new technology, though revolutionary, remained confined to some pockets of irrigated areas only.

In this context, some changes can easily be seen, with the help of table 1,2, and 3 which are indicating area, production, productivity, irrigation use, fertilizer use, and agricultural modernisation at the inter-state level for the relevant period. Andhra Pradesh is a classic case where there is no evidece of increase in productivity in the post 1966-67 period (Table-1). The icrease in production in earlier phase was mainly due to productivity increase and to some extent because of area When viewed against the back-drop of absence of expansion. dynamism in second phase, it suggests that the state has remained almost untouched by the new technology. When one analyses the data relating to changes in irrigation land intensity of cropping (Table-2) there is nothing to suggest wide-spread use of higher level of technology than what was existing. The increase in irrigation and intensity of cropping is too small to suggest any non-traditional technological The only evidance of some non-traditional technology change. is to be found in use of fertilizers and high yielding variety seeds and increase in tractor use (Table-3). Here also tractor use may have increased mainly on account of transport need. Maharashtra is a shade worse than Andhra Pradesh. The increase in production and productivity is phenomenal after 1966-67 clearly indicating the impact of the new technology. The fertilizer use and percentage of area under High Yielding Variety have been second highest. The tractor use increased by 270 per cent in spite of the fact that it depicts highest number of tractors per hectare both in 196-67 and 1972-73 (Table-3). Not that it ranks first so far irrigation is concerned but that the expansion of irrigation is quite impressive in the second phase. There is sufficient evidence to show that agricultural development has taken place in these two states.

Karnataka, Uttar Pradesh and Kerala find their place next only to Punjab and Haryana, where the production productivity increase is higher after 1966-67 than before it. The number of tractors per acre has increased by 150 per cent in Karnataka as against 175 in U.P. which has remained second highest in this. From the point of view of fertilizer and HYV seeds the ranking will be in order of U.P., Kerala and Karnataka (Table 3). The area expansion in case of Kerala is reflected in increase in intensity of cropping by 10 per cent after 1966-67. This increase in use of land in Kerala can be attributed to strong communist movement there. West Bengal is not much different than Kerala. Thus, the role of communist movement which also brought about changes in relations of production can not be ruled out in this context. Uttar Pradesh joins the rank of Kerala and West Bengal in its claim because Western U.P. is almost similar to Punjab Haryana belt.

Rajasthan which resembles U.P., Kerala and Karnataka so far trend in production and productivity is concerned suffers from the limitation that the magnitude of change is not as high as theirs. The fertilizer use and area under H.Y.V. seeds is

the second lowest and lowest in M.P. and the tractor use was the second lowest in 1966-67 and the lowest in 1972-73. This is also a classic case of non-development. Bihar, Orissa and Gujrat find themselves in a situation which is characterised by lower growth of production and productivity after 1966-67 than before it.

the states which have achieved agricultural development in the quarter century after independence are Punjab, Haryana, Kerala, West Bengal and Western U.P. are also the areas where semifeudal 'relations of production' are found to be weak. Pre-British India was a feudal monarchy disintegrated with the advent of colonial But the feudal relation of production was not formation. allowed to disintegrate completely. Landlordism and semibonded direct produces were nourished and strengthened. this process a dualistic pattern of agricultural development emerged during colonial period which has further got impetus during post independence period due to faulty planning policies. The whole process has created a biased pattern of agricultural development among different regions of the country.

#### POST INDEPENDENCE PERIOD

On the eve of independence, Indian agriculture was in a very poor shape. Once food surplus India has become food deficit country. The best canal irrigated agricultural tracts went to Pakistan. Rich Jute producing zone became the part of

Bangla Desh, east while Eastern Pakistan. In order to feed the teaming millions, agriculture became the chief plank of Indian planning and development. The large number of refugees, who came to India posed a great problem of rehabilitation. Secondary and tertiary sectors were least developed. with these the prevailing technique was also very backward. The land was only means to satisfy the problem Therefore, the strategy of extention rehabilitation. agricultural land was followed for agrlicultural development. The reclamation of Tarai land and agricultural extention in the marginal agricultural land were vigorously persuied. In that period any effective step in the direction of restoration of regional balance in agricultural development was not undertaken. The reason seems to be obvious that the story of agricultural development all over India was the story underdevelopment.

Accidently nature was benign in the begining. During First Five Year Plan mansoon was quite normal therefore the agricultural production was quite high. A complacency stepped in and less attention was paid on agricultural development during secon Five Year Plan. But the mansoon did not remain so favourable in the Second Plan. The food problem, again became very paramount so in Third Five Year Plan equal emphasis was laid on agricultural and industrial development. The last year of Third Plan was the period of economic crisis in India. The three factors of this period may be considered vital in the context.

- i. The years 1965 and 1966 were the years of unprecedented drought in India.
- ii. The year of 1965 was the year of Indo-Pak war.
- iii. The year of 1966 was the introductory period for I.A.D.P. Programme in India.

The last point needs further eloboration. I.A.D.P. Programme which is also known as Intensive Agricultural Development Programme was introduced at the instance of World Bank. In this programme it was envisaged that the area of good agricultural infrastructure should be given preferential treatment. This idea was based on the principle that in the areas of rich agricultural infrastructure I.C.O.R. woul be the highest. For increasing production in poor areas, high investment is required. So in those areas where agricultural infrastructure was already existing found preferential treatment. The new technology package was provided to farmers on subsidised rates. On success of I.A.D.P. Green Revolution Technology was introduced in Indian agriculture. This new technology was the technique of H.Y.V., Irrigation and Fertilizetrs.

The net outcome of Green Revolution technology was that areas of assured canal irrigation were most benefitted. These areas were mostly the canal irrigated tracts of colonial period. The H.Y.V. responds highly to fertilizers. For the use of fertilizer, assured irrigation was a pre-condition. Thus, the areas which were benefitted in colonial period got the

highest benefit of the Green Revolution Technology. This has solved the food problem at the national level. The production of foodgrains increased from 53 million tonnes to 108.4 million tonnes over the years 1950-51 and 1970-71. The country became self sufficient in food requirements but a most challenging problem of regional dualism was created during this process. The country was distinctly devided in two types of regions: First, agricultural prosporous zone of Green Revolution areas comprising Punjab, Haryana, Western Uttar Pradesh and some parts of Rajasthan. Second, the rest of India which became the hungry belly of India that included most of the area of rainfed cultivated zone and dry farming areas. In short, the Green Revolution Programme was instrumental in creation as well as promotion of regional duality in India.

Another important negative impact of Green Revolution Programme is the increase of structural inequality. The Green Revolution technology was not scale neutral. The Green Revolution technology package benefitted only rich farmers. Specially tractors and pumping sets were most profitable and viable to rich farmers. The poor farmers who could not uphold this technology were marginalised (Table-3). Therefore, the Green Revolution did not create only a prosperous enclave but also created a rich sect of farmers who cornered all the benefits of Green Revolution Programme. A number of studies coroborate the fact that Green Revolution has produced more problems than what it solved.

Now the pressing problem before the country is the problem regional inequality which may be called regional solve this problem, a new thinking started in this direction in Fourth Five Year Plan. In this plan the programme of regional balance became very significant. A number of area oriented programmes were introduced. The mention may be DPAP, CADP, SDAP, Coastal Area Development Programme and Desert Development programme etc. These programmes were started with twin objectives. First, to bring the developmental benefits in those areas which were left outside from the development impulses introduced by centralised planning at macro scenario. Second, the objective of these programmes was to make the poor also a partner in development benefits. In this way these area oriented programmes were area oriented as well as people oriented programmes. But these programmes had some great limitation. All the areas and all the people who may be the target and target group could not be brought under the perview of these programmes. The paucity of resources was the great hinderance. The second limitation was that the programmes were started by different departments without proper and effective coordination. The consequence was that in some areas there was a multiplicity of programmes while other areas were left altogether. This may be designated as a unique phenomenon of development gerrymandering. In other words, the principle of area selection and principle of beneficiary selection were applied in such a way that suited to the wishes of decision

makers. This accelerated the process of credibility gap between planners and planned and also generated soft state.

agricultural policies of Fourth Five Year Plan were retained in Fifth and Sixth Plans but with one major change. The poverty elevation programme became paramount in Fifth and Sixth Plan and thrust were directed towards poverty elevation. Here two lessons of these programmes are specticular. First, for poverty elevation the increase of total production is also important. Logic is simple: bigger the cake greater the share. An effort to increase the agricultural production through new technology creats the problem of environmental degradation. Therefore, secondly, apart from economic efficiency distributive justice, the environmental compatibility in growth of agriculture has become very significant factor. It is very clear that on the eve of 21st Century India will need 30 crore tonnes of foodgrains. It means within a decade around 12 crore tonnes increase in foodgrain production is essential. At the same time it is also distinct that in poor areas the maintenance of healthy environment is of atmost significance because the cost of environmental restoration cannot afforded in poor areas. The excessive irrigation, excessive use of fertilizers and pesticides and excessive cropping intensity have already started to show their negative impact on agriculture. Even in most agricultural advanced states like and Haryana plateau level has been reached in agricultural production (Table0-4). This calls for a new doze

of input to break the plateau level. If it is applied environmental degradation is bound to crept in.

Then what may be the remedy? Undoubtedly the existing pattern of agricultural development in the country may provide some conclusive answer to this problem. If we glance at the agricultural development pattern of the country, three facts emerge as very important in this connection.

- i. Green Revolution is confined to a very limited zone of canal irrigated area. This zone was not the top productive tract of the country before the introduction of assured irrigation.
- ii. Quite extensive rice zone of the country which is from ages has been reckoned as most productive tract of India could not get the benefits of Green Revolution to the desired extent as Green Revolution in India remained mostly a wheat revolution in which rice regions suffered.
- iii. The third tract is most extensive which is mostly rainfed.

  The coarse grains like millet are the chief crops.

The aforesaid zoning and agricultural development pattern provide the answer for our problem. If the Green Revolution is brought in rice cultivated area as well as in coarse grain cultivation area where the potential of agricultural development is very high, the target of 30 crore tonnes of foodgrain production may be easily attained. Secondly, the development of agriculture in areas of agricultural distress

may also solve the problem of regional inequality. The equality is not required to be a scissors edge equality. It is to be obtained by upgrading the distress area. It will also provide an answer to often stated truth that scissors blade equality is more dangerous than the existing inequality. This will also provide a sufficient safeguard against the environmental degradation. In this context agricultural scientists are to play a major role. They are to upgrade the technique of dry farming and rainfed cultivation. To sum up the paper it appears relevant to suggest that in the present circumstances we do not require technological revolution but we require technical change.

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Table 1: State-Wise Indices of Area Production1 and Yield of Agricultural Produce

States	Index of Avg. production  Five Year Ending*		Index of Area under all crops  Five Year Ending*		Index of Agr. productivity.  Five Year Ending*	
	India	108.88	122.08	104.66	103.69	102.28
Andhra Pradesh	114.33	101.15	102.78	100.02	111.43	100.84
Bihar	124.71	116.73	101.14	101.85	125.20	114.08
Gujrat	131.69	114.70	99.44	102.82	132.66	111.10
Karnataka	110.21	129.89	97.85	99.51	112.73	130.53
Kerala	112.98	127.67	107.75	116.17	103.75	111.03
Madhya Pradesh	92.86	125.32	104.50	110.99	88.82	113.17
Maharashtra	99.36	92.14	100.56	97.35	98.78	99.80
Orissa	131.16	113.11	108.59	95.77	120.49	118.20
Punjab & Haryana	114.98	170.11	102.00	109.94	110.41	157.80
Rajasthan	103.13	108.10	106.46	103.38	96.82	121.13
Tamil Nadu	116.36	117.32	118.57	118.80	109.72	131.83
Uttar Pradesh	110.71	130.70	101.97	103.32	115.83	120.39
West Bengal	118.77	124.35	106.12	108.15	114.05	112.86

<sup>\*</sup>Base period for the Five Years ending 1966-67 is the average agricultural producttion for five years ending 1960-61 and for the Five years ending 1972-73 the base period is five years ending 1966-677.

Source: (1) For index of Agricultural production, Jose A.V., Growth and Fluctuation in Indian Agriculture 1956-57 to 1972-73, Ulloor, Trivandrum (memograph).

<sup>(2)</sup> For area under all crops, Government of India, Ministry of Agriculture and Irrigation.

States	Average percentage of Average Intensity of Gross Area Irrigated Cropping to Gross Sown Area					
	to	1962-63 1 to 1966-67 1	to	to	to	to
India	17.92	19.22	22.18	1.14	1.15	1.17
Andhra Pradesh	29.34	29.56	30.24	1.09	1.11	1.13
Bihar	18.22	20.81	25.24	1.35	1.28	1.30
Gujrat	7.51	8.87	13.76	1.04	1.05	1.07
Karnataka	8.16	9.96	12.97	1.03	1.04	1.06
Kerala	21.58	19.84	20.53	1.21	1.23	1.35
Madhya Pradesh	5.18	5.75	7.62	1.12	1.11	1.12
Maharashtra	6.18	7.07	8.47	1.05	1.05	1.06
Orissa	18.60	13.49	15.51	1.08	1.24	1.25
Punjab & Haryana	39.43	47.10	60.20	1,31	1.30	1.39
Rajasthan	12.33	13.27	16.13	1.08	1.07	1.29
Tamil Nadu	41.12	45.45	46.10	1.27	1.19	1.19
Uttar Pradesh	25.11	28.67	35.34	1.26	1.27	1.32
West Bengal	*21.93	22.83	21.81	1.16	1.19	1.26

Source: Jose A., Growth an Fluctuations In Indian Agriculture 1956-57 to 1972-73, Ulloor, Trivandrum (memeograph).

States	Average consumption of Fertiplizers per hect in Kg. for the five years ending 1972-73	Area under HYV .of seed to Net sown area for the five years	ctors per '000 hect.
India	13.20	11.33	0.40 1.08
Andhra Pradesh	21.91	7.29	0.26 0.57
Bihar	9.77	16.38	0.26 0.69
Gujrat	12.68	8.28	0.34 0.87
Karnataka	12.89	5.12	0.23 0.58
Kerala	21.45	11.60	0.20 0.68
Madhya Pradesh	3.86	3.27	0.15 0.27
Maharashtra	8.91	6.22	0.18 0.34
Orissa	4.42	4.28	0.11 0.32
Punjab & Haryana	29.55	30.22	2.09 7.77
Rajasthan	3.15	6.04	0.30 0.78
Tamil Nadu	35,54	30.23	0.55 0.85
Uttar Pradesh	19.52	15.86	0.58 1.60
West Bengal	11.18	23.79	0.28 N.A.

Source : (1) Fertilizer Association of India, Fertilizer Statitics.

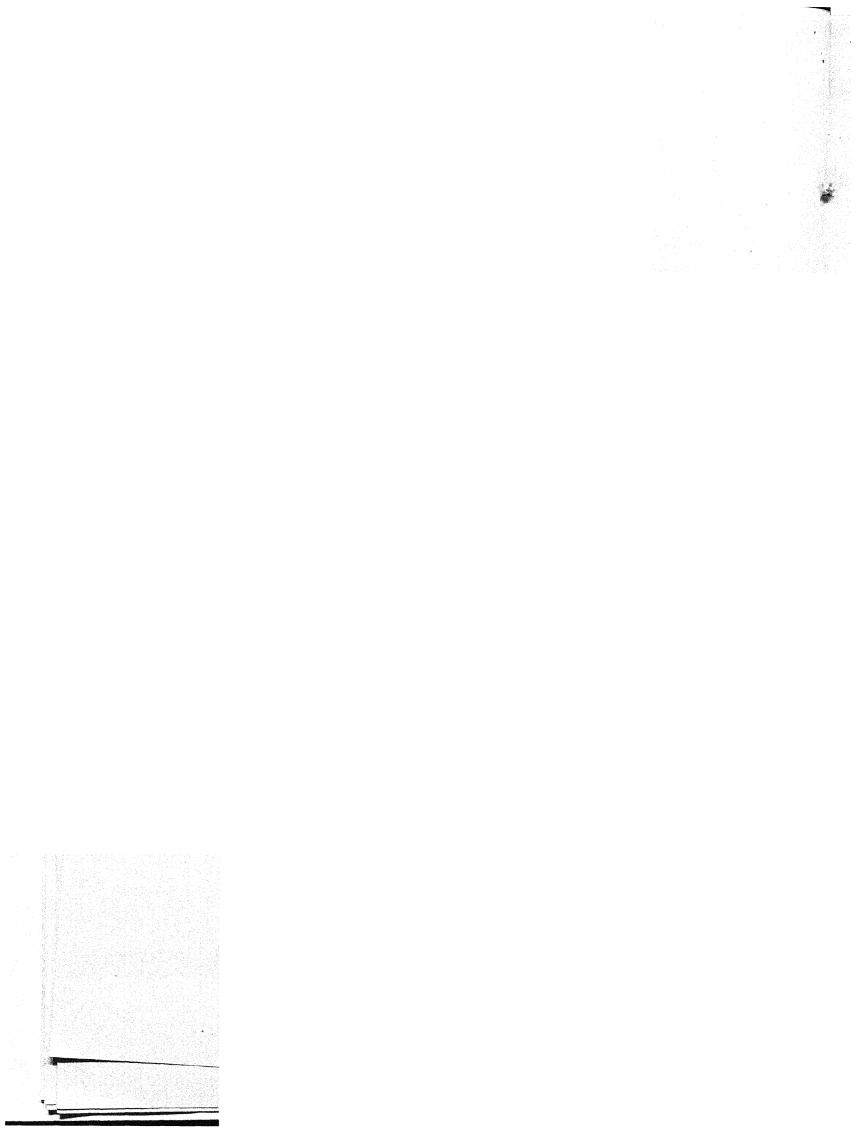
<sup>(2)</sup> Statistical Abstract of India.

Table 4: <u>Index of Gross Cropped Area, Gross Irrigated Area, Production and Consumption Of Chemicals and Fertilizers.</u>

(Base Year 1973-74 = 100)

States	Gross Cropped Area 1986-87			Consumption of Chemica- 1s and Fer- tilizers (N.K.P.) (1986-87)
Andhra Pradesh	88.38	104.96	105.70	296.37
Bihar	96.89	136.97	140.50	574.51
Gujrat	108.21	174.95	79.06	176.77
Karnataka	108.52	158.02	120.31	254.44
Kerala	95.70	66.77	90.46	207.21
Madhya Pradesh	104.72	194.92	127.03	290.65
Maharashtra	101.81	139.57	155.39	310.66
Orissa	126.73	175.76	121.10	208.56
Punjab	119,96	142.67	210.85	287.21
Rajasthan	98.62	162.41	101.06	284.62
Tamil Nadu	85,09	77.41	103.90	219.65
Uttar Pradesh	109.53	157.93	194.29	309.18
West Bengal	110.04	124.01	139.68	553.17
All India	104.38	138.23	137.03	294.04

Source: Inter-state Comparative Statistics, 1989, Ecoinomic and Statistics Division, S.P.I., Uttar Pradesh.

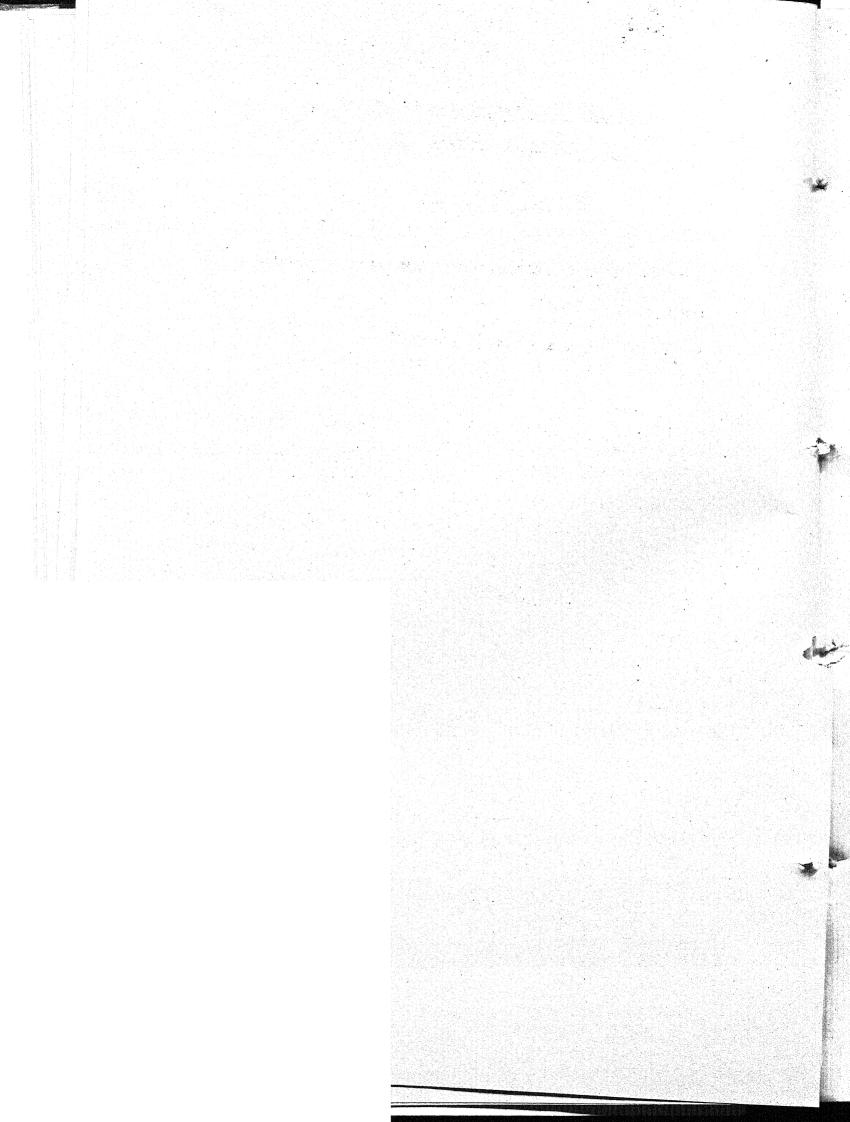


RESEARCH AND DEVELOPMENT
IN INDIA:

A REGIONAL PERSPECTIVE

Ву

Vikram Chadha



# RESEARCH AND DEVELOPMENT IN INDIA : A REGIONAL PERSPECTIVE

### Vikram Chadha\*

the time of independence, the Indian planners were aware that for a rapid and sustained increase in incomes. output and employment, industrialisation of the Country was However, for industrialisation, a major indispensable. the acquisition of appropriate technology, requirement was suiting the endowments and requirements of the Country. For the acquisition of technology, the planners have had the choice either adopting an open door policy of resorting to indiscriminate import of sophisticated technology from advance countries; or to assume an autarkic posture - by totally stopping technology imports and instead depending entirely on indigenous technologies, generated through domestic research and development (R & D). Nevertheless, both these options were unacceptable to our planners, because whereas the former would have lead to a dependent development of the Country, the latter woul have been totally unfeasible, given the serious lack of capital base and shortage of technical equipment and manpower, at the time of independence. Thus India adopted a 'broad front' technology policy i.e., of importing such critical

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technologies which were indispensable for immediate developmental needs and could not have been developed indigenously in the near future, but simultaneously, to make a gigantic efforts to create domestic technological capability, through local R & D by strengthening the Country's Science and Technology (S & T) infrastructure, in order to achieve long run technological self reliance. Thus, both a short run tactical perspective of technology import and a long run development perspective of generating indigenous technology, through our own R & D, was adopted (Kabra, 1986). In this way, the achievement of technological self reliance became the hallmark of India's development strategy.

In order to achieve technological self reliance, India has invested quite substantially in creating the R & D and S  $\,$  &  $\,$  T infrastructure, both at the central and the state levels. vast array of diverse S & T and R & D institutions laboratories were set up, like the Council of Scientific Industrial Research (CSIR); Indian Council of Medical Research (ICMR); Indian Council of Agricultural Research (ICAR) special Department/Commissions like Atomic Energy Commission and Department of Space etc.; R & D laboratories of the agriculture, health and industry Ministries of coordinated through the Department of Science and Technology; Cooperative Research Associations in Textiles and Cement sectors etc.; Priate Trusts, Foundations and Societies and inhouse R&D units in public and priate industry, monitored by the Department of Scientific and Industrial Research (DSIR).

## RESEARCH AND DEVELOPMENT IN THE STATE SECTOR

Along with the promotion of S&T and R&D activity in the central sector, the states were also expected to strengthen their own scientific and technological research. It was thought that as a matter of decentralised approach to the achievement of technological self reliance, the states of the Indian union ought to allocate substantial sums for S&T and R&D activities, in order to stimulate technological change in various sectors of the state economy. The states must set up their own R&D institutions to provide research infrastructure to the growing technical requirements of their industries. Though the R & D effort in the states has been deployed and is rather modest, yet it is growing significantly, as shown in table 1.

Table 1 shows that whereas R&D expenditure in the central sector increased from Rs.1.10 crores in 1948-49 to Rs.2481.19 crores in 1987-88, at an annual rate of over 15 per cent, the R&D expenditure in the state sector increased from Rs.1 crore in 1958-59 to Rs.214.88 crores in 1987-88, at an annual rate of about 12 per cent. Similarly, the states' expenditure on related S&T activities increased from Rs.5.21 crores in 1975-76 to Rs.74.31 crores in 1987-88, at an annual growth rate of over 14.5 per cent. Thus the table brings out:

(i) The expenditure on R&D and related S&T activities in the states, has been rather modest, though it has been increasing at an adequate rate. (ii) The awareness to strengthen S&T and R&D infrastructure in the states came about at a much later stage.

Out of a total S&T expenditure in the state sector of Rs.258.21 crores during 1986-87, about 74 per cent was spent on R&D activities, out of which 42.2 per cent was on applied research, 17.4 per cent on basic research and 40.2 per cent on experimental development. The state governments accounted for barely 9 per cent of total S&T expenditure in 1986-87, which constitutes merely 0.1 per cent of the Country's GNP (Goernment of India, 1988).

Table 2 presents the expenditure of R&D by various state governments. The table shows that there has been a relative concentration of R&D expenditure in favour of predominantly industrially developed states, so that e.g., in 1986-87, out of an expenditure of Rs.191.86 crores, the states of Maharashtra, Uttar Pradesh and Gujarat, together incurred over 38 per cent, while in 1984-85, the states of Maharashtra, Karnataka, Madhya Pradesh, Gujarat and U.P. accounted for almost 50 per cent of the total R&D expenditure.

In absolute terms, among the largest R&D expenditure incurring states, R&D expenditure in Gujarat state increased from over Rs.8 crores in 1980-81 to Rs.19.6 crores in 1986-87, at an annual compound rate of over 13 per cent; in Karnataka it increased from Rs.7.43 crores to Rs.9.6 crores, at an annual rate of 2.27 per cent and in Maharashtra, it increased from Rs.6.17 crores to about Rs.29 crores, at the rate of 32.5 per cent, over this period.

However, the R&D expenditure increased at the highest rate of over 61 per cent in Rajasthan, where it went up from about Rs.0.6 crores to over Rs.8 crores during 1980-81 to 1986-87; followed by Andhra Pradesh and Assam, where it shot up by over 55.5 per cent and about 38 per cent respectively, over the study period.

Table 3 shows the distribution of R&D expenditure in the state, by objecties. The table shows that over 1980-81 to 1986-87, the major share of R&D expenditure in the state has been incurred on the development of agriculture, forestry fishing (over 92 per cent). This is justified also because most of our states are agricultural states, with a majority of agricultural population, which calls for an improvement agricultural productivity through agricultural However, a bright feature of the composition of R&D expenditure in the state sector is the tremendous growth of R&D in health services and other socio-economic services, where it increased by over 116 per cent and 124 per cent respectively, though the said part is glaringly low R&D expenditure incurred on industrial and transport development. In case of industrial development in the states, R&D expenditure virtually fell from Rs.1.67 crores in 1980-81 to Rs.1.14 crores, at an annual rate of 5.3 per cent and in case of transport and communication, it fell from about Rs.83 lakhs to Rs.6.72 lakhs, at the rate of over 35 per cent.

Table 4 shows the number of scientists and technical personnel engaged in R&D and S&T activities in the State owned

R&D establishments. The table shows that the total number of R&D personnel in the state R&D institutions increased from 1000 in 1958-59 to oer 24 thousand in 1986-87, so that their percentage of the total Indian R&D personnel in the research establishments increased from 5.54 per cent to 15.53 per cent.

## IN-HOUSE INDUSTRIAL R&D IN THE STATE

In-house research and development by industrial enterprises is known to be significantly related with the growth of industry. Siddharthan (1988) found a positive correlation between in-house R&D expenditure and sales turn over/gross profit in the Indian corporate sector.

The Government has been giving a number of fiscal and monetary incentives to industry, to set up their own in-house R&D units. Table 5 presents the break up of in-house R&D industrial units and expenditure, both in public and private industry in the states and union territories in India.

The table shows that out of 876 in-house industrial R&D units, in 1987, 95 were in the public sector industry and 781 in the private industry. Out of the public industrial R&D units, 11 were in West Bengal and 10 each in Andhra Pradesh, Karnataka and Maharashtra. Among private in-house industrial units, about 300 were in Maharashtra alone. Tamil Nadu accounted for 87 in-house industrial R&D units and Gujrat had 71 private industrial R&D units.

The broad pattern of in-house industrial R&D expenditure shows that the gross in-house industrial R&D expenditure in the private sector was exceeded than that in the public

industry. Whereas, in-house R&D expenditure in public sector increased from over Rs.122 crores in 1983 to over Rs.237 crores in 1987, the private industry spent over Rs.291 crores on R&D. However, the fact can not be ignored that very few public sector industrial units have been making much larger R&D expenditure, as compared with over 8 times the number of R&D units in private sector.

Some other broad features of the regional distribution of in-house industrial R&D units and expenditure, as can be drawn from table 5, are as follows:

- (i) More than 78 per cent of total R&D units were located in the states of Maharashtra, Tamil Nadu, West Bengal, Karnataka and Andhra Pradesh, accounting for about 86 per cent of total R&D expenditure.
- (ii) Out of this, about 38.2 per cent of industries, accounting for one half of total R&D expenditure, were located in the state of Maharashtra alone. Other states having sizable number of R&D units and expenditure were Tamil Nadu, West Bengal, Gujarat, Karnataka an Andhra Pradesh. In 1987, Maharashtra alone spent about 50 per cent of the total inhouse industrial R&D expenditure.
- (iii)About 47 per cent of total industries in the public sector, located in Karnataka, Andhra Pradesh, Bihar, Gujrat, Haryana and Tamil Nadu, accounted for about 84 per cent of total public sector R&D expenditure during 1986-87. Almost the same is the case for earlier years. Out of this, Karnataka alone accounted for about 33 per cent of

total R&D expenditure, while Andhra Pradesh, having about 10 per cent of the total public industrial units, accounted for about 21 per cent of public in-house industrial expenditure.

## PLANNING AND THE S&T PROGRAMME IN THE STATES

The institutional industrial R&D infrastructure in the States was further reinforced with the inception of Fifth Five Year Plan, by strengthening facilities in the States for industrial testing an evaluation, industrial undertaking consultancy services to small scale industries and formulation of regional development schemes, utilising the available; research and development schemes, surveys exploration of natural resources; prepration of feasibility reports for industries having potential in the area. The Plan intended to constitute State level committees on Science and Technology on the pattern of National Committee on Science and Technology. Tamil Nadu, Maharashtra, Uttar Pradesh, Andhra Pradesh and Bihar were the states to set up such S&T committees. These Committees would function in association with the experts and expertise available with Central R&D organisations, like ICAR, CSIR and ICMR, in planning specific proposals for scientific and technical development of the By 1985, S&T Councils were set up in 18 States and 4 union territories. In addition, 13 states have also set up seperate Departments of Science and Technology (Government of India, 1974 and 1985 .)

## UTILISATION OF R&D FACILITIES TW MITE CM PES

While the Fig infrastructure and expenditure in the states may have been improving, yet the commercial utilisation of the R&D facilities by the various sectors, particularly industry, is not taking place. In a recent study (Chadha & Sandhu, 1987), of the Industrial Development and Quality Marketing Centres in Punjab, have found that though the Punjab Government has set up a well knit chain of 18 Industrial Development Centres (IDCs) and 15 Quality Marking Centres (QMCs) in the State, to provide common facilities for manufacturing, finishing, processing, testing and analysis and to render technical guidance to small industrial units for standardisation and productivity improvement, yet their services are not being optimally utilised by industry of this region. This is born out by the fact that the number of technical tests performed by the IDCs, for the benefit of small industry owners, decreased by 5.3 per cent per year, during 1977 to 1984. These institutions have been spending more on unproductive activities like travel and office expenses much less on publicity and materials. Their industrial and technical services have remained underutilised due to lack of qualified technical staff; non-availability of appropriate raw materials; presence of obsolete equipment and poor maintenance of existing machinery and due to their uneconomic location. Besides this, they hardly made efforts to publicise their facilities among industrialists.

In another study (Chadha, 1990) of 117 manufacturing industrial enterprises in Punjab, Haryana, Himachal Pradesh and Chandigarh, seeking technologies in its various forms, from 10 R&D establishments in the region, we found that though 84 of the sample units could successfully utilise institutional industrial technologies in their production process, yet they were 'not so satisfied' with their interaction with R&D institutions (the Index of 'degree of satisfaction' was computed to be .42). In this sample, comprising of wide array of industries, only 11.11 per cent units were 'very satisfied'; 15.38 per cent units were 'satisfied'; 61.54 per cent were 'not so satisfied' and 11.97 per cent units were just 'not satisfied' with their interaction with the R&D institutions.

Regarding the problems, that the enterpreneures faced while commercialising the technologies acquired from R&D institutions, 62 per cent of the sample units reported that these technologies are 'partial'. In other words, the technologies developed by R&D establishments, passed on either only the design or the prototype alone or the blueprint of the process only, and these technologies were not in a packaged form, accompanied by their comprehensive tooling, components, training, demonstration and operational guarantees etc. Thus they were risky to commercialise. A high Index of above average importance (h = 1.57) was given to this problem.

Likewise, 58 per cent of the units submitted that since a lot of time elapses between the idea generation stage and innovation stage, the technology developed by R&D institutions

has high probability of market failure. This constraints the entrepreneures from commercialising their technologies. This problem got a high Index of h=1.46.

Other problems, for not being able to commercialise the acquired institutional technologies, which are of above average importance (with h 1), are that these technologies are ji 'half baked' and are developed only upto bench scale, thus require lot of costly upscaling before being utilised in production; and that R&D institutions generally charged high rates for their technologies, which made them highly cost ineffective.

## CONCLUSION

The R&D expenditure and infrastructure, both in the central and state spheres, has been increasing, with the objective of attaining technological self reliance. However;

- (i) the R&D expenditure in the states is much lower, as compared with that the central sphere, though the growth of R&D expenditure in the state is not so slow.
- (ii) the R&D expenditure has been growing only in those states, which have a sound industrial base, like in Maharashtra, Karnataka, Gujarat, Tamil Nadu etc. Thus there is relative concentration of R&D expenditure in a fewer states, while for a more balanced development, there ought to be greater dispersal.

- (iii)R&D expenditure for industrial development in the states has been much lower, as compared with other objectives. Whereas in the context of our development strategy, more R&D expenditure should be allocated for upgrading industrial technologies for rapid industrialisation.
- (iv) There has been a much less emphasis on the utilisation of existing R&D facilities by industry. R&D institutions do not take ostensible measures to publicise and popularise their technical research among industry. A serious gap exists between R&D and industry. R&D institutions produce only partial and half baked technologies, which make their techologies unacceptable to industrialists from economic point of view.

Thus the regional policy must emphasise on a balanced allocationn of R&D expenditure, not only among all states, but also among different development objectives, like industrial and agricultural development; health and education; transport and communication etc. There has to be greater emphasis on inducing the manufacturers to utilise and assimilate indigenously developed technologies, by making them more comprehensive, cost effective and suitable for the requirements of the industry and the market.

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8. To determine the 'degree of satisfaction' of the enterprises, with their inter-relationship with R&D institutions, following index was calculated:

I = 2 a n i i i n i

where, ai = weighting factor i.e.

0 = for not satisfied;

1/3 = for not so satisfied;

2/3 = for satisfied;

for very satisfied;

n = number of units.

O was assigned, if there was no contact; 1/3 weight was attached, if number of contacts fell between 1 to 25 per year; 2/3 weight was given, if number of contacts were between 25 to 50 per year and 1 weighting factor for contacts over 50.

We have divided the total number of contacts between R&D institutions and industrial units into the ese 4 categories, on the basis of the relative extent of number of contacts reported to us by each unit, during the survey.

See, Corsten, H., "Problems With Cooperation Between Universities and Enterprises - A Comparatie Study on Size of Enterprises", <u>Technovation</u>, <u>Vol.6</u>, <u>1987</u>, <u>pp. 95-307</u>.

9. To arrive at the relative importance of promoters and barriers in the technology transfer and utilisation, we applied the following Index (Corsten, 1987):

where, nji = number of units 'i', expressing problem 'j';

Z = Shji = Total number of arguments or rows;

j = problems (rows);

i = group of units (columns).

The index hji can assume values between zero and Z, whereby,

- (b) Z = if the whole group of units 'i' expressed
  the problem 'j';

- (e) > 1 = if group 'i' attached above average importance to problem 'j'.



India presents a picture of extreme regional disparities. This may be inter - state or intra-state. The relatively developed and under-developed states do-exist. If we take per capita income, state domestic product, industrial and agricultural development, standard of basic public services, vent difference are found emong states. Some of the states do not provide even the basic amenities like pure drinking water, electricity, roads, elementary education and medical facilities to its rural population even i after 40 years of planaed development. Such differences broadly may be due to unequal natural resource distribution on one hand and deglect of some regions and/or in adequate investment and development effort on the other.

A minimum of infra-structure facilities should be developed in all the states. The over all growth of a state largely depends on infra-structural development. Table I shows Index of relative development of infra-structure of major fifteen states prepared by CMIS. In infra-structure facilities, very little improvement could be noticed over a period of 20 years, specially in low income states. Only the rank of Haryana (from 5 to 2) and Gujrat (7 to 5) has shifted upward, while West Bangal, Hihar have shifted downwards, remaining others are where they were.

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This show that Gisparities in the infra-structure facilities are almost at the same level. Six states out of major fifteen states are still below the all India average.

Indian Federation provides extensive powers to the Central Government to correct inter-state disparity to a reasonable extent (article 275 & 282 of the constitution).

Resources are transferred from central to state by way of ;

- 1) Shared Taxes
- 2) Grants in Ald
- 3) Loans

There are transferred on the recommendations of Finance Commission (a constitutional body) and Planning Commission (non - constitutional body).

Broadly, devolution is made on the basis of population, relative backwardness, standard of services (administrative & others) resources raising efforts, fiscal needs etc. The formula have changed from time to time, without going into the debace of the role of Finance Commission visa vis planning commission and the satisfaction or otherwise of receiving states, we examine whether such devolution has norrowed down interstate disparity or not.

First Finance Commission (1952) distributed 55% net proceeds of income tax to states on 60% population basis and 20% collection basis. Second Finance Commission(1957) distributed 60% net proceeds on 90 % population basis and 10% collection basis. Third finance commission (1961) distributed 66 % of net proceeds of income tax. The basis was 2/3 / 80 % population and 20% collection.

Fourth Finance Commission (1965) distributed 75% revenue - 80% population and 20% collection basis.

Fifth Finance Commission (1969) included Advance tax collections also in it. The % share remained the same i.e. 75 % and the basis - 90 % population, 10 % assessment. Sixth Finance Commission (1973) increased the sheet of states from 75% to 80% and the fermula and share remained the same in seventh Finance Commission (1973) also k i.e. 80 % share with 90 % population basis and 10% assessment basis.

# encere dimise

Pirst Pinance Commission distributed 40% share smong

Commission reduced it from 40% to 25% and basis of distribution is 90% population and 10% for adjustments.

7. Third Finance Commission's distribution, population remained the major basis but same adjustment was made on the basis of relative financial weakness, disparity in development percentage of schedule castes, tribes etc.

Fourth Finance Commission distributed 20% share of excise duties - 80% population and 20% relative economic and social backwardness; as measured by seven indicators, fifth Finance Commission distributed 20% share - 80% population and 20% economic and social backwardness; two third of which distributed only among states with per capita income below average per capita income of all states.

Sixth Finance Commission distributed 20% share at the basis

of 75% population and 25% relative economic and social backwardness the distribution of this portion should be in relation to the distance of a state's per capita income from that of the state with the highest per capita income multiplied by the population of the state concerned. Seventh Finance Commission increased the share of states to 40%. Percentage show of each state in the divisible pool determined by assigneing 25% weight to each of the following four factors (a) population by 1971 census (b) projected population as on 1.3.1976 / per capita state domestic product (c) Percentage of poor in total state population (d). Formula of revenue equalisation as worked cut by the Commission.

Thus downward shift in the weightage to population and street on backwardness had started with the neventh Finance Commission.

In the case of distribution of Grants in Ald .

every Finance Commission has tried to estimate and meet the

budgetory gap on revenue account of the states.

Grants - in - aid

NO. OI States	Purpose
I F.C. 7	Ceneral
<b>**</b>	Special for primary education.
11 11	General
10	Special for Communication.

III. All except Maharashtra

IV 10 States

10 States

1/5 of their budget deficits

Budget deficit.

VI. All except 7 atates

Backwardness reduce regional disparity.

VII. ě.

A 10

16

General

For upgradation of Services in non Development sectors.

Frof. Raf Krishna has Dissents poorer States gettinglass.

VIII. 2 4

Mr. 50

17

Inflicit grant

Upgredation

Special purpose to cover the deficit (Flan & non plan) Revenue Deficit grant

Revenue plan deficit grant.

Through all the Commissions took into account the special needs of States, the approach was piecemeal in the sease that only one or few particular services social or administrative (VIII) were considered for special grant. All the important public services and infra-structure, facilities taken together should be the criteria for special grants. NFC in its normative approach touched this issue.

Regarding distribution of income tax VIII Pinance Cormission recommendations ensured greater share for the poorer states. It was divided 10% on collection basis and 90% of the divisible pool on the basis of (a) 25 % on population basis (b) 25 % on the basis of increase of per capita income multiplied by population and (c) 50 % on the basis of distance of per capita income from the highest - per capita income state multiplied by population. This formula remained some in Nigth Pinance Commission also.

In case of distribution of the net proceeds of

1. 100 Union excise duties, it remained 40 % in VIII Finance

Commission 10% of it was divided on the basis of colle
tion and 90% the divisible pool (a) 25 % on population

basis (b) 25% on the basis of inverse of per capita

income multiplied by population and (c) 50% on the basis

of distance of per capits income from the highest - per 
capita - income - State multiplied by population. Eight.

Finance Commission also prepared a new principle of

directly linking develution to deficit rather than

dealing with them only through grants - in- aid. The same

formula was adoped by Ninth Finance Commission also.

As a result of this only 32.5 % of divisible income tax and 25% of central Excise receipts are distributed on the basis of factors which are not aimed at equalising the spending capacities of the states. The cumulative effects of the working of Finance Commissions since the Eighth Commission has been the steady reduction in the shares of the richer States in central transfers for the benefit of low income states.

In making the dilocation between the states, we had to balance divergent consideration. How to recording the need to accelerate the development of the backward states, without hindering the further development of the advanced ones ? It is true that we have leaned in favour

<sup>1.</sup> Renuka Viswanathan - Enforcing Financial Maciplina E.P.W. Pg. 1283

<sup>2.</sup> Remuke Viswanathan - Snforcing Financial Discipline Z.P.W. Pg. 1783

of the former, and tried to make our scheme of devolvetion more progressive, but we think, that this is what the national interest, at present, requires.

of the centre and the state were taken broadly on the basis of the actuals and records of the potential of the centre and the states and the complexions.

From the decide to the states by way of taxes, duties and grants-in-sid recommended by the sighth and Ninth Finance Commissions. The table stove that under the minth Finance Commission, the per cepits transfer of resource from the centre, tensfitted the states more than under the Righth Finance Commission award. In ranking however, Rejestive has markedly improved its position in this respect from the seventh to the first while west Bengal slided down from the second to seventh.

If we lock at the relationship of per capita glb with per capital transfer (Table 4 ) we find that the ratio of each states per capita transfers to its per capita income of the last 3 low income states, Bihar, Orrise, Rajasthan, Utter Predesh & Machya Pradech are getting relatively more as compared to Maharastra, Punjab.

المنافقة الم

<sup>\*</sup> Mountaine approachs Estimation of tax capacity on the base's of had the state exploited as the tax base to an average extent. In that basis projection for 89-90 then 89-90 because the base for the projection for 90-95. (Thus a normative base), for assessing the Captral Govt. In tax raverse potential a 15% brend rate of growth was assumed.

Haryana, Gujarat and Karmataka. Thus the Minth Finance
Commission has made a sincers effort of helping more
needly states more which was one of the objectives.
The MFC has stated "our scheme of transfer gives special
consideration to wanker states," This fact is further
established by looking at par capita Revenue surplus /
deficit after transfers.

The NTC for the first time has taken into account the revenue plan requirements of the states and has recommended for both Revenue deficit grant and Revenue plan deficit grant. It could be seen from the table 5 that even after transfers some states will experience deficit (M.P., Kerela, Orrisa, Rajasthan, Uttar Predesh, West Bangle). In this regard, commission has stated.

"the position that emerges from our recommendation (participarting developmental grants) partly to meet plan deficit) is substantially better than the position of those states would find themselves in if, as far before, only non-plan deficit were taxaled by the Finance Commission.

The Commission has suggested that such states should make extra efforts to fill the revenue gap. In that case the planning commission may give them special long-term loans to cover a part of the remaining revenue deficit so that only a minor part of the overall revenue deficit of them states will have to be met by diverting their normal borrowings.

<sup>1.</sup> Winth Pinerce Commission, Second Report Fg. 31

<sup>2.</sup> Nings Pinance Comfasion, Second Report Fg. 32

<sup>3.</sup> The Second Report of MPC - Pg. 32

upgradation and for social problems have been built in the requirements of the states in this regards which is assessed on nonsetive basis. The first report had recommended for the upgradation grant for improvement of certain beneficial services. On this issue, we agree with justice A.S. Qureshi (member) who gave his note of dissent on this issue and opined "the advantages of such grants is that they would be tied grants for specific purposes. It was possible to insist upon the performance relatable to the grants from the concerned states."

VIII commission had recommended for upgradation grant of Rs. 967 Crore which was 2.5 % of total grant. Though the NFC took into account revenue plan meeds of the states also, the transfers to states has deminished to 22.7 % of total central revenue receipts which was 24.1 % according to RFC. 2

The normative tax estimates for 14 major states were more than the conventional over by less than 1 % and the normative non-plan revenue expenditure were less by 3.5 %.

The basis of devolution echane formulated by NPC is flowed in many respects. First, because the commission has pre-empted and projediced the role of the NEC and planning commission. Second because the EFC has not provided any convencing rational from the planning point of view for arriving at its estimates of minimum plan

<sup>1.</sup> The second report of NFC - Fg. 54, Note of Dissent.

<sup>2.</sup> D.T. Lukdawate - An overview EPW June, 9, 1990.

<sup>3.</sup> Saff. Lakdawala - An overview EFW June 9, 1999.

revenue expanditure. Third because it has arbitrarily taken into account only 40% of post devolution non plan revenue surpluses as being available for plan financing from the states. Forth, because the plan deficit grants

coconwended by NAC bear no rational or equitable relation to the deficite which they are designed to

cover in part.

FINDINGS: Thus after analysing different Pinance Cormissions report and criterion adopted by them we find that;

- 1. The horizontal inequity still persists which may be a threat to mational unity and integrity.
- 2. Some of the states specially low income dispersions still less behind the mational average with respect to basic public and social services.
- Through the costen has powers under article
  275 & 282 of the Constitution to correct interstate disparity, it has not minimised eignificeatly.
- 4. To improve the fiscal health, all the finance Commissions almed at providing more essistance by adopting backwardness, low per capita income. Low level of services and other similar criteria for devaluation, in actuality in terms of per capita assistance has not come true. Hetrogancity amongst states makes it difficult to evolve formula acceptable to all.

<sup>1.</sup> S. Guhan - Flaved Devolution scheme, 3PW

<sup>2.</sup> D.S. Nag - Belanced Regional Davelopment we Macionel Integration. YOUANA April 16-30, 1990

- 5. Fighth & Minth Finance Commissions have changed criterion materially. The weightage to population has been reduced from 60 to 90 by previous commissions to 25 % by last two commissions.
- 6. Whath Finance Commission adopted a pometive approach, which has to some extent benefittled low increase states note still the transfers do not exactly correspond to the gaps of the states.
- transfers (92 % under VIII & 83 % under IX FC)

  table 6 where population is given 80 to 90 %g

  veightage (upto VII FC) Even in Gadgil formula

  for plan assistance the weight to population is

  60 % . The over all result is regressiveness i.e.

  lower per capita plan outlay and central assistances

  to under-developed states.
- S. For capits state income is reflected in per capite plan outley. Low income states are under the victors circle of low per capita income/sDP causing low level of budget surpluses which is reflected in low capacity to undertake.

  investment for growth in plan expenditure.

#### SUCGESTIONS:

The problems of regional imbalance can not be tackled in simply financial terms i.e. providing additional finances. It requires a planned approach.

<sup>1.</sup> A. Bagohi - BIW, Dec. 3, 1938

- 1. Infre-structure facilities should be one of the fectors in devolutation minimum of social and economic infre-structure for all the states should be determined and them special assistance to be provided to the states legging behind in these facilities.
- 2. Determination of national minimum of 'Public Services' specially education, health, roads.

  drinking water, electricity etc.
- 3. Periodical revision of NMS and S infra-structure and Public Services.
- 6. Motivating states to themselves come forward with the schemes ensuring for the proper utilisation of own resources and central easistance.
- 5. Measures to promote private investment in backward areas.
- 6. Special areas (billy, tribal, drought prova)

  development programmes with central assistance.
- 7. Resources surveys of development potential.
- 8. Projects in the public sector should be fairly dispensed over various regions.
- 9. A Central Institute of Regional Development about the contain transfer and rates of growth in different areas.

<sup>1.</sup> U.S. Mag. - Vojana April 16-10, 1990.

## COMPARATIONS

nor desirable but a national minimum of facilities should be available for all the citizens irrespective of the fact in which they reside. For this Finance Commission could play an important role by providing greater assistance to backward states by make including a few more criteria like legs in development potential for growth special need for building infra-structure etc.

TABLE - I

(1966-67 to 1987-68

littlex of Anlative development of Infra-structure

Major Atates	3956-67	¥	1575-77		1980-61	2	1987~88	12
	entelle etter itte spendige	Africa.	the second of the second distance and the	San with	terminariae ancaimme appresse	ojten.	The results of the court of the	tives:
Panjab	201	1	216	1	215	1.	214	S. Barre
Baryana	1.09	5	151	并	154	27) 45	143	4
framil Redu	171	2	152	3	153	uni.	142	17.
Kerala	135	4	167	*	137	4	140	đ.
Gujerat	111	25	122	E	123	5	130	B
W. Bengal	150		133	5	132	To a	12.3	6
Hahermahtra	2.27	E	111	<b>£</b> ,	118	7	1:4	**
U.P.	207	8	112	7	107	8		3
Andres							20 mg.	1,,,,
Frakesh	93	10	97	11	98	10	103	Ç.
Karnataka	90	11	105	9	101	£.je	93	10
Bihar	98	9	104	10	97	11	98	10
Assam	73	22	89	12	93	12	93	* *
Ortesa	69	7.3	79	13	8.8	13		1.2
Rajasthan	59	14	81	1	77	14		13
M.P.	53	15	61	15	52	12		14
교육 경기를 가장하는 것 같습니다.							* **	166 "唐

Frot Note: The development of infra-structure states has been mainly financed by the transfer of resources from the central government to the state governments.

any shrinkage of the infra-structure of the state. It only means that the rate of expansion of infra-structure in there states has been slower than all india average rate of expansation correspondingly as increase in the index means a faster than average rate of expansion.

Source Table - I: CMIE - Basic Statistics Relating to the Indian Sconomy - Sept., 1989 Vol. 2 States.



# TABLE - II

A note on the sources and method of computation of Index Number of availability of Infra-structure facilities in different states.

antina dalla cuesto		Heights
2.	BOWER	**
	1. Per capita densumption of electricity (KWF	01 (
	2. Per capital Industrial consumption of electricity (KWH)	£2,
	J. Percentage of villages electrified to total No. of villages.	5
d. 4	A Secretary and the secretary	20
	4. Parrentage of met/gross area irrigated to total met/gross cropped area	20
3.	RORDS	45
	5. Road leagth in Km. per 100 sq. Kms. of	5
	6. Amber of motor vehicles per lakh population	•
	7. Length of Mational Highways in Fm per 1000 Sq. Kms. of area	
4.	RATEWAYS	20
	8. Railway Route length in Km for 1000 sq.	20
5.	POST CIPICES	5
	9. No. of permanent post offices per lakh population	2.5
	10. No. of letter boxes per lakh population	2.5
5.	BUCATION	10
	11. Miteracy percentage	4
	12. Schooling facilities (ensciment % of age group in )	
	a) I to 3V	2
	b) v te 1x.	2
	c) X to X	2

## TABLE + II

	The state of the s	
	13. No. of Hospital Reds per lakh population	
8,	BANKING	6
	14. per capita deposits (Rs.)	:
	15. per capita bank credit (Rs.)	
	16. Pumber of bank offices per lakh population	
100000000000000000000000000000000000000		a recognização a acquisição a acquisição de acquisições de acquisi

## EXPLANATORY NOTE

Table 2 is a note on the sources and method of computation of Index member of availability of Infrastructure facilities in different states prepared by CMIS. Index sumpers given in Table I covers the mixteen indicators that are listed in Table II. It should be stressed that the weights indicated alongside are purely subjective and it is difficult to offer any universally acceptable basis in purely quantitative terms for there weights. All that can be argued in its favour is that in our view the reights seems to reflect, more or less adequality, the relative roles of different elements in greath process.

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Transfer of Resources and Property of the Castles o

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TABLE - IV

Per capits Transfer and its Ratio with per capita Income Non special category states - 1990-95.

Stat		Per capita based on 1981 population	Transfers (Rs.)based on 1982-85 average population	Per capita SDP(New series) average 1982-85 (Rs.)	Ratio of per capita transfer a per capita Income
1,	Andhra Pradesh	1292	1229	<b>2</b> 053	0.5986
2.	Fraceso Bihar	1580	1495	1323	1,1300
3.	Gujarat	996	9 43	2919	0.3231
4	Haryana	875	814	3043	0.2675
5.	Kernataka	1067	1008	2461	0.4096
<b>6.</b>	Kerala	1309	1250	2144	0.5830
7.	M.P.	1453	1373	1960	0.7382
8.	Maharashtre	961	909	3384	0.2686
Ġ.	Orissa	2028	1936	1728	1.1204
10.	Punjab	<b>93</b> 5	686	4013	0.2200
11.	Rajasthan	1769	16 47	1820	0.9049
12.	Tamil Nadu	1250	1198	2142	0.5593
ii.	U.F.	1544	1461	1713	0.8529
14.	West Bangle	1330	1263	2230	0.5664

Source - The Minth Finance Commission, Second Report Fg. 31.

#### TABLE - V

Fer capital Revenue surplus/Deficit after transfers in Non-special category states (Excluding Goa): 1990-95

- CANADAS CONTRACTOR C	a contraction contractors or designations and designations and designation of the designa		pees) /Deficit
1.	Andhra Pradesh	(+)	6417
2.*	Bihar	(+)	24
3	Gujarat	(+)	767
4.	Haryena	(+)	1454
5.	Kamateka	(+)	792
6.	Korela	(-)	162
	K.P.	(-)	60
	Maharashtra	(+)	1389
9.	Orissa	(-)	210
10.	Punjab	(+)	468
11.	. Rajasthan		280
12	[일화화] [1] 교회의 조막점 (2000년 - 120년 -	(4)	523
13	어린 경기를 내다면 살아왔다. 그 얼마나 사이를 하지 않는 것 같아?		260
14	한 동지않아 하다 한 경기를 가는 사람들이 모르게 몰라 이 동작	(-)	•

Source - The Minth Finance Commission, Second report

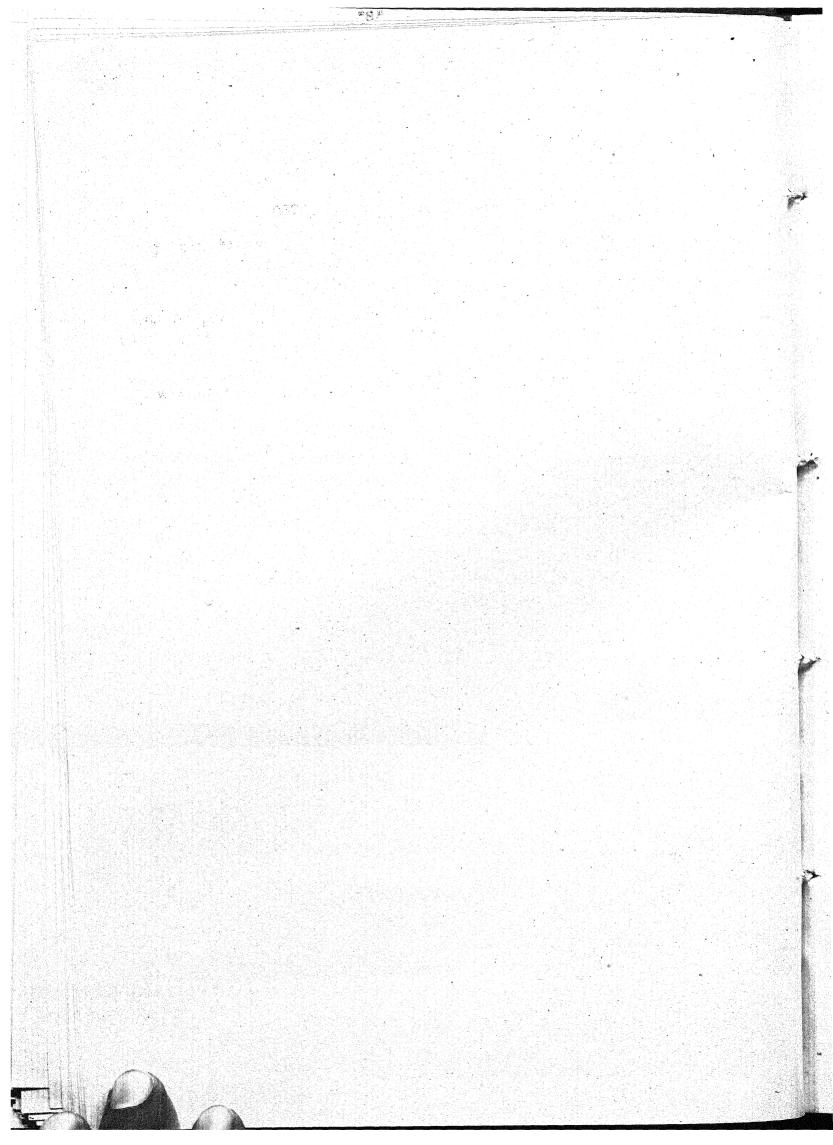
TABLE - VI

## Devolution under Finance Commission awards

	Tax	Deficit grents	Other grants	Total grants
, kc	3592.52 (88.80)	486.22 (11.92)		486.22 (11.92)
/I rc	6 <b>944.</b> 5	815.84	928.78	37 <b>44.6</b> 2
	(79,92)	(9.39)	(10.69)	(20.08)
II FC	18811.25	136.92	387.38	52 <b>4.3</b>
	(97.29)	(0.71)	(2,0)	(2.71)
III R	33124.96	968.17	1420.86	2389.03
	(93.27)	(2.73)	(4.0)	(6.73)
DI RC	67 <b>88</b> 2 (93)	15017	3 <b>1</b> 37	19154 (17)

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#### MEASUREMENT OF TREANISATION

A New Index with an Exercise for Indian States

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Professor of Economics Desi Anilya Vishwa Vidyalaya Indose

#### MOTIVATION

In the literature on urbanisation one finds a host of measures that try to capture various features of urbanisation. These measures can be categorised in two droups: those capturing positive or desirable features and those capturing meastive or undesirable features. In the former category fell level, degree, growth and tempo; and in the latter, scale, concentration, ranksize rule and primary indices. That the description by one variety has to be supplemented by the other is often emphasised. We note, for example,

Degree of urbanisation .... reveals only one dimension of the urban process. It gives only the level of urbanisation but does not show how the urban population having the same degree (level) of urbanisation in terms of percentages may have quite different size structure of urbanisation implying that measuring the degree of urbanisation by way of calculating percentage of urban population needs to be supplemented with measures of size (structure) as well.

The supplementation is necessary but not sufficient. The separate measures depicting two different kinds of features

<sup>1.</sup> Office of the Registrar General of India (1934). Urban Growth in India 1951-1981 (a Statistical Analysis): Census of India, 1981. Monograph No. 1. New Delhi (Misprinting Corrected).

do not help in overall assessment of the situation and therefore, making in comparison over time or space. But an index combining the two features is constipicuous by absence. If the two features are assigned relative weights, they can be collapsed into one composite index. But this demands a fairly intuitive exiomatic structure. In this paper, we intend to make the gap good by developing a composite index through use of fairly simple and appealing axiomatic structure.

## AXIOMATIC STRUCTURE

Urbanisation is essentially a function of partial, ordered, population distribution vector truncated from below at some cut-off point. Although declaration of a human settlement as 'urban' in sest of the countries is based on a number of criteria yet, empirically, 'the distinction between urban and rural locatidies rests on a quantitative criterion of number of inhabitants'. Let this threshold population size be P\*. Also, let

- H \* number of habitations or human settlements:
- N = number of urban habitations or urban settlements;
- T = total population of the country;
- U \* total population of the urban units; and
- A = average population size of the urban units.

i. It is needless to say that the cue comes from the field of measurement in the area of welfare, poverty, inequality.

<sup>2.</sup> United Nations (1973) The Determinants and Consequences of Forulation Trends (Vol. I). New York.

when all urban units have population equal to P\*, we may assign any arbitrary number 0, 1, 8/H or N P\*/T. In this case, it is obvious, average population-size of urban units a is equal to threshold population-size P\* dividing human settlements into rural and urban ones. When a rises above P\* in a way that all urban units—grow at the same rate, there can hardly be a disagreement that urbanisation also grows. However, when a rises in a way that growth of different units is not uniform, one is not sure whether urbanisation also grows and, if it does so, at what pace. In order to tackle this situation, we set up following axioms:

- (1) GROWTH AXIOM (AXIOM G): Other things remains the same, an increase in average size of urban units results in an increase in urbansisation index.
- (2) DISTRIBUTION AXION (AXION D) : Other things remaining the same, relative distribution in favour of larger units results in reduction in the urbanisation index.

<sup>1.</sup> These axioms may look close to monotonicity axiom and transfer axioms respectively. However, strictly speaking, there are not the same. Moreover, we are not invoking here POCUS AXIOM which could purport to say 'so long there is no change - absolute or relative - in the population distribution over urban units, the value of urbanisation index should not change'. We do not do so for our traditional measures of urbanisation reflect the changes in the population-size of rural habitations.

It may be noted that while Axiom G relates to distributionneutral growth. Axiom D relates to growth-neutral distribution. Both these processes may take place due to either natural growth or migration.

Our index would reflect even the change of status of a human settlement from rural to urban or vice-versa. It should cortainly reflect the emergence of a new human settlement or the exitinction of an old one.

## DESIVATION OF INDEX

Let us arrange our population of urban units in an increasing (strictly speaking, non-secreasing) order :

$$P^{a} \leq P_{1} \leq P_{2} \leq P_{3} \leq \dots \leq P_{k} \qquad (1)$$
 and define excess population ratio S, so :

so that

$$0 \leq E_1 \leq E_2 \leq E_3 \leq \dots \leq E_1 \quad (3)$$

Keeping in view the distribution axiom, let us assign larger weights to smaller excesses, i.e.,

$$w_1 > w_2 > w_3 > \cdots > w_1 > \cdots > w_N$$
 (4) so that the contribution of unit i to the urbanisation index is proportional to

If the urbanisation index, denoted by  $I_{CH}$ , is defined as the normalized linear aggregate of  $V_1E_1$ , we can write :

$$\mathbf{I}_{CH} = \mathbf{B} \sum_{i} \mathbf{x}_{i} \mathbf{B}_{i} + \mathbf{D} \tag{6}$$

where F and D are normalization parameters.

A very simple way of accompolishing (4) is to define  $W_1$  as:  $W_1 = N + 1 - 1. \tag{7}$ 

Substituting (2) and (7) in (6) and making use of standard definition of Gipi coefficient of concentration G. for large K, we find

$$I_{CR} = B_{*} = \frac{R^{2}}{2} \left[ \frac{A}{D^{*}} (1 - G) - 1 \right] + D$$
 (8)

whose value crucially dependance B and D.

For fixing B and D. we provide following two normalization exions BL and N2 :

- (3) NORMALISATION AKIOW 1 (AKIOM N1) . When all urban units have population equal to  $F^{\mu}$ , the urbanisation index is equal to  $RF^{\mu}/T$ .
- (4) NORMALISATION AXIOM 2 (AXIOM N2) . When all urban units have population equal to A. the urbanisation index is equal to NA/T.

Invoking Axiom N1. which means  $A = P^*$  and G = 0, we find D to be equal to  $NP^*/T$ . Therefore, (8) gets transformed into (9):

$$I_{CH} = B \cdot \frac{R^2}{2} \left[ \frac{A}{p^*} (1-G) - 1 \right] + \frac{Rp^*}{2}$$
 (9)

Further, invoking axion R2 by substituting  $I_{CH}$  by RA/T on the left hand side and G=0 in the right hand of (9), we get

Substituting (10) in (9), we obtain

which can be simplified to show that

$$I_{CH} = \left(-\frac{\sigma}{T}\right) (1 - G) \tag{11}$$

where U is obviously MA.

## PROPERTIES OF INDEX

The index I<sub>CH</sub> is strikingly simple (and simple is beautiful). It is useful. It is easy to compute as (U/T) and G are readily available. When there is no urban unit, it is equal to zero. So long U is positive (and so T is positive). I<sub>CH</sub> is positive. It is equal to 1 when all units are urban and have equal population, i.e.,

Thus, its range lies between 0 and 1 which is what we insist on indices.

It may be noted that the measure ICH is a function of P. P. P. P. P. P. P. and T :

$$I_{CH} = f(P_1, P_2, \dots, P_N, P^*, T)$$
 (12)

It may be desirable that if population of every unit grows at the rate of growth of total population (it is immaterial whether because of natural growth or migration) and if the threshold population  $P^*$  is raised by the growth factor (which is equal

to 1 + r where r is the rate of growth), the level of urbanisation remains invariant. In other words,

$$f(P_1, P_2, \dots, P_N, P^*, T) * f(OP_1, OP_2, \dots, OP_N, OP^*, OT)(13)$$

And, we find this is satisfied by (11). This property, goes with the name 'SCALK-INDEPENDENCE' in the literature on inequality.

oalled 'FREQUENCY-INDEPENDENCE'. It may be stated as , if the number of habitations in each population size were to increase in the same proportion, the measure of urbanisation will remain the same. These two requirements alongwith the one that the range of urbanisation should lie in interval (C.1) are however also satisfied by the traditional urbanisation measure.

We may be interested in knowing the differential impacts of the arguments that enter the index. For this, we have to remember that T subsumes total rural population R in addition to total urban population U. Splitting T into R and U. (11) can be written as

$$I_{CH} = \begin{pmatrix} 0 \\ 0 + R \end{pmatrix} (1 = 0)$$
 (14)

which can be differentiated with respect to U.R and G.and elasticities with respect to each of the arguments can very easily be obtained. They are presented below in the Table 1. It may be noted that changes in U and R are autonomous and they do not owe to aignation.

TABLE 1 . DERIVATIVES AND ELASTICITIES OF URBANISATION INDEX

AT KITTET É	i i i	Electicity
Management of the second of th	The state of the s	大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大大
	E (2 - 0)/N2	*/*
	1 - 1 (1 - 6)/12	w RA
•	1 - U/T	the the second contract of the the second contract of the second con

We can however see that if a person migrates from a rural unit to an urban one, without causing change in C, the overall impact would be equal to (1-G)/T. Therefore, if M people migrate from rural areas to urban areas and get distributed proportionately, then the change in the index is equal to  $[m \cdot (1-G)]$  where m is the migration rate (defined as M/T l.e., the ratio of migrants to total population). This is fairly obvious.

## THE EMBRICISE

The basic purpose of this paper was to develop the composite index of urbanisation, which encompassed both positive and negative features of the process. However, with a view to providing empirical flavour, we have carried out a simple exercise for various states/regions and the country as a whole for which the basic data on (n/T) and G have been lifted from the census secondgraph 'Orban Growth in India.1951-81'. See Appendix Table and Appendix Grain. As an illustration, we cite a few results too.

According to traditional measure (U/T), the urbanisation has risen by 35 per cent in the country as a whole while according to our measure I<sub>CH</sub>. It has barely increased by 10 per cent. Again, according to the traditional measure the urbanisation has barely increased by 11 per cent in Nest Bengal. It has increased by over 22 per cent as per our measure. If one considers North Kastern Region, the level in 1981 is 3.37 times that in 1951 as per traditional measure while our measure computes it to be 4.48 times. The urbanisation level of 'other areas' is reported to have risen by 75 per cent by traditional measure, it has really gone down by 16 per cent if I<sub>CH</sub> is employed.

In the measure I<sub>CR</sub>, it may be noted, a qualitative dimension is added. In this sense, if the highest value of (U/T) were to refer to the 'most' urbanised state, the highest value of I<sub>CR</sub> would refer to the 'best' urbanised state. In this way, our ranking of states is found to be different from the one obtained by the application of the traditional measure. See Table 2. Over time movement of (U/T) would thus indicate whether urbanisation has risen/declined and that of I<sub>CR</sub> would indicate whether it has improved/deteriorated.

TABLE 2: UNDANISATION STATUS OF STATES IN INDIA

Status	1951	1961	1991	
Most	Gujarnt	Weheresh tra	Meharashtra	Nehernahtra
Best	Gujarat	Tamil Nadu	Tamil Nadu	Karviataks

Note: We have left tother greas' out of consideration in this Table

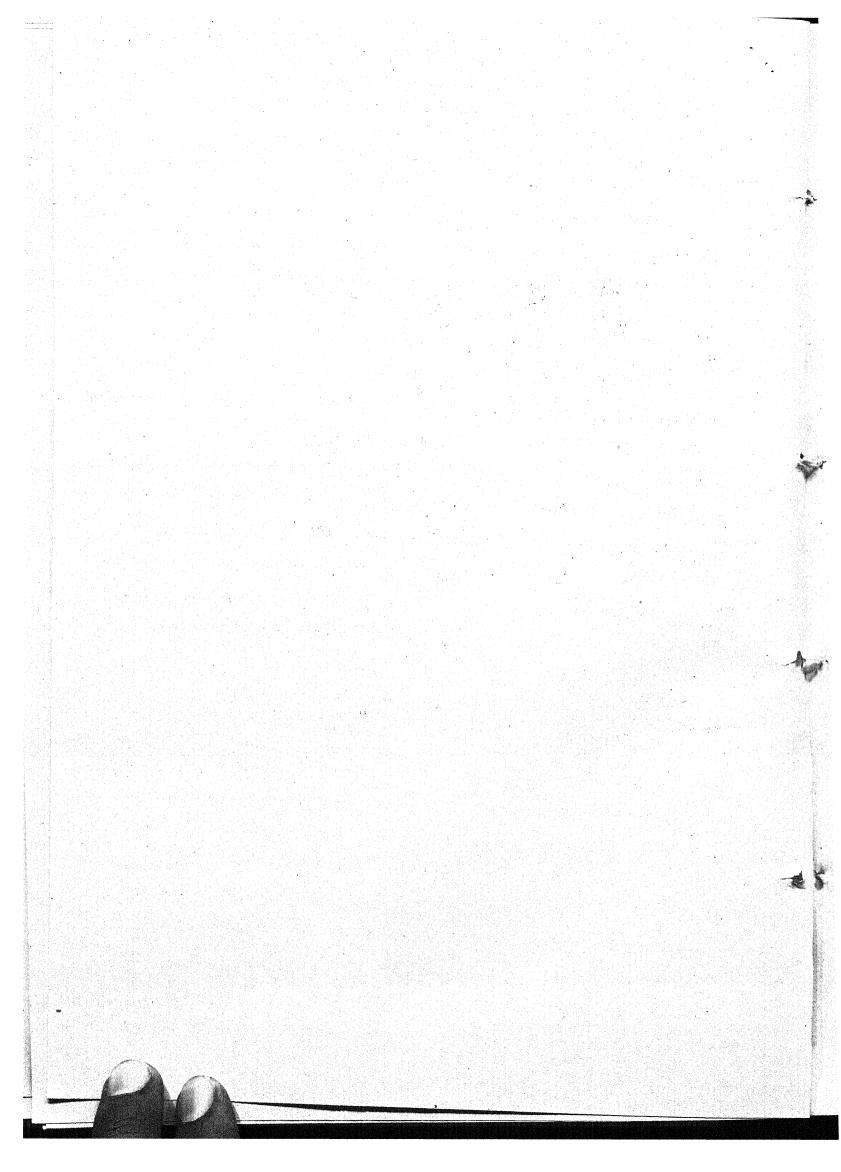
APPENDIX

TABLE MEASURES RELATED WITH URBANISATION FOR INDIA AND HER STATES

State	Index	Uni.t	1951	1961	1971	1981
INDIA		No.	17.59 0.554 78.45	18.24 0.600 72.96	20,21 0,628 75,18	23.20 0.636 86.27
Andhra Pradosh	(U/T) G I <sub>CH</sub>	Ko.`	17.42 0,486 89.54	17.44 0.539 86.40	19.31 0.574 82.26	73.32 0.579 98.18
Bihar	(1971) G (1971)	No.	6.7? 0.499 33.92	8.43 0.491 42.91	10.00 0.488 51.20	12.47 0.524 59.36
<b>Gu</b> jarat	(U/T)	No.	27.23 0.517	25.77 0.580 108.23	23.08 0.669 109.79	31.10 0.626 116.31
Haryana	(U/T)	Ko.	17.07 0.429 97.47	17.23 0.461 92.87	17.66 0.476 92.54	21.88
Katnataka	(U/T) G ICH	% No. %,	22.95 0.483 118.65	22,23 0.541 102.04	24.31 0.575 103.32	28.89 0.585 119.89
Kerala	(U/T) C I CH	Mo.	13.47 0.469 71.53	15.11 0.445 83.86	16.24 0,520 79.95	18.74 0.457 105.51
Madhya Pradeah	(U/T) G I <sub>CH</sub>	No.	12.02 6.505 59.50	14.29 0.513 69.39	16,29 0,559 72,00	20.29 0.559 89.48
Maharasht	ra(11/T) G <sup>I</sup> CH	я́ No.	22.75 0.618 86.90	26.22 0.707 83.81	31.17 0.730 84.16	35.03 0.747 88.63
North Bastern Region	(U/T) G I <sub>CH</sub>	No.i	4.97 0.540 22.86	8.59 0.427 49.22	11.17 0.474 58.75	16.75 0.389 102.34

Table continued

States	Index	Unit	is an interpretation of the second se	1961	1971	1981
original and a second a second and a second and a second and a second and a second	radionaria ani ani (U/T) (U TOH	A Commence	4.06 0.356 26.15	6.30 0.300 39.18	8.41 0.450 46.25	11.79 0.473 62.13
Punjab	(u/t) G Ich	No.	21.72 0.516 -46.512 105.12	23.05 0.549 	23.73 0.571 101.80	27.68 0.608 108.51
Rajasthan	(U/T) G I <sub>CH</sub>	ro.	18.50	16.28 0.493 82.54	17.63 0.546 80.04	21.04 0.551 94.47
Temll Nadu	(WT)	No.	24.35 0.557 112.74	26.69 0. <b>663</b> 116.63	30.26 0,616 116.20	32.95 0.649 115.65
Utter Pradosh	(D/2)	* ************************************	13.64 0.567 54.05	12.85 0.616 49.38	14.02 0.628 51.25	17.95 0.60 71.25
West Bengal	(U/t) e I <sub>CH</sub>	Ko.	27,88 0,683 75,70	24.45 0.671 80.44	24.75 0.672 81.18	26 <b>.46</b> 0 <b>.65</b> 0 92 <b>.61</b>
Other Areas	(U/T) G	no.	25.50 0.648 89.50	33.36 0.831 56.38	30.93 0.860 54.50	44.93 0.833 75.03



# ENTREPRENEURSHIP DEVELOPMENT IN A NOTIFIED BACKWARD ECONOMY

S.S. KHANKA\*

## Introduction

entrepreneurship is the cause the government of India has notified all backward districts into three categories, viz.

A. B and C. to provide special incentives and concessions to establish industries to foster entrapreneurship development.

All the three districts of Kumaun Division — Almore, Pithoragarh.

Nainital — fall in the category of 'A' districts for this purpose.

Inspite tof this, the facts and figures suggest that thore has not been any perceptible improvement in the entrepreneurial front and thereby industrial scene of the division. In fact, this is an area in which no empirical research has been done so for in the division. Therefore, it was thought timely to make a modest contribution in regard to emergence, performance and publishes of entrepreneurship development in a notified backward economy like Kumaun.

#### Scope and Method

The study is exclusively based on the primary data collected through a sample survey of the 50 small scale entrepreneurs spread over two sub-regions of Kumaun — Almora town, i.e. hills (22 units) and Haldwani town, i.e. plains (28 units). Two criteria were adopted for one's inclusion in the sample survey. (1) The unit must be the manufacturing unit, therefore, repair and other service shops were not included in the sample study. (2) The entrepreneurs must be the first

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generation entrepreneurs. A well structured questionnaire was designed for collection of data at entrepreneur level and administered to the 50 selected entrepreneurs during January-February 1988.

#### Objectives

The specific objectives of the study are: (i) To identify
the entrepreneurial class that took initiative to launch the
ventures and trace its social, economic and geographical origins.

(ii) To measure the performance of the entrepreneurs and ascertain
whether there exists a relationship between social, economic and
geographical background and their performance. (iii) To configure
the major problems that impede a vigorous display of entrepreneurs.

(iv) To suggest measures for the healthy growth of entrepreneurship
in small sector in a notified backward division like Kumaun and
also point out the policy implications flowing from the findings
and conclusions.

### Main Findings

### Entrepreneurial Setting

Origin: The study reveals that four fifth of the entrepreneurs happened to be the natives of Kumaun Division of which 70 percent from the local industrial locations. Thus, only one-fifth of the entrepreneurs migrated from places outside Kumaun. Thus, the local participation more especially in the hills in the entrepreneurial scene is very evident. Two main conclusions can be drawfrom this lopaided geographical origin of the entrepreneurs. First an overwhelming preponderance of the native entrepreneurs in the total sample population is a happy augury in the sense that the

local entrepreneurship is emerging for taking advantages of the government incentives and facilities for developing entrepreneurship in the division. The relatively more recent origin of even more than four-fifth sample units also tends to support this conclusion. Second, the smaller participation of the outside entrepreneurs more especially in the hills suggests that distance and availability of industrial infrastructural facilities deter entrepreneurial mobility.

That like India, entrepreneurship in our division is still caste-based is evinced by an overwhelming majority of the Hindu Castes (82 percent) in the total sample population. The other castes, namely, the Muslims (10 percent) and Sikhs (8 percent) are poorly represented. The Jains are, however, totally unrepresented in the present sample.

The occupational origin of the entrepreneurs showed that more than four-fifth of the entrepreneurs (82 percent) came from the families with business background. Besides, a close look at the entrepreneurs' last occupation and their family occupation revealed that among the entrepreneurs whose last occupation was profession and entered directly, more than one half hailed again from families with business background. Like in other parts of India (Deshpande 1984:102-103), these figures are, thus, suggestive of the fact that the caste and the family occupation really matters for one's entry into entrepreneurship. At the same time, it also underlines the question why entrepreneurship is not becoming broadbased by embracing entrepreneurs from the total spectrum of all castes in the division, especially when the government has declared

to provide certain incentives and concessions to the society as a whole to establish industries in the notified backward areas like Kumaun.

Characteristics: The 50 entrepreneurs were all men. The conspicious absence of woman entrepreneurs in the study is mainly attributed to the age-long peculiar culture/the traditions the Indian society is wedded to, which largely delimit the women entry into entrepreneurship. The mean age having an 'urn-shaped' age-structure, at which the entrepreneurs founded their enterprises was approximately 34.9 years. This suggests that the propensity to assume the entrepreneurial role becomes the maximum in the prime working-age which tends to decline with the advancement in age. The larger entry of the umarried persons as compared to their married counterparts into entrepreneurship again tends to confirm the contention that most of the entrepreneurs established their units at an early age. Compared to the local entrepreneurs, the migrant entrepreneurs established their units at a later age.

entrepreseurial career increases with more educational qualifications. Two plausible explainations for this may be observed.

First, such larger entry into manufacturing might have occured due to the time the entrepreneurs were required to devote to their education. Second, they might have been delayed to assume the entrepreneurial role on account of their failure to have any other job involving a fairly larger opportunity cost but maintaining parity with their higher educational qualifications. The Nigerian

Carl.

cases) for leaving their previous occupation. The other reasons like retrentment, personal reasons, desire to create jobs for others were found insignificant. If one is to view these various reasons in the dichotomy of voluntary and forcely reasons, nearly nine-tenth (\$6.6 persont) entrepreneurs left their previous occupation on account of voluntary reasons again reflecting their economic motive behind it and only one-tenth for the forced reasons. The economic consideration for leaving one's previous occupation is found more pronounced in their case who have attained higher levels of education and who were business owners before starting industry. Its higher intensity among the educated is quite understandable because one's expectation for achieving higher incomes increases in line with his/her educational attainment.

Considerations for Selecting Small Enterprise: 'Easy to start' was found as the most important consideration for selecting a small scale unit and the government encouragement ranked second. However, the most practical type of consideration, i.e. 'limited investment' was not considered as a crucial factor for limiting the scale of one's operation because of the least capital requirements of the traditional units. The migrant entrepreneurs weighed government encouragement and limited investment as decisive factors for selecting the small size of the unit.

Industrial Location: 'Home land' factor was considered the most important factor selecting the present location of industries followed by the infrastructure consideration and the marketing opportunities in that order. Most of the new entrepreneurs from

farming castes selected the home land' because alongwith the new activity— they have continued their traditional occupation as a secondary activity which may serve as a cushion against business risks. However, the government incentives, availability of raw material, labour, cheaper land have not been comprehended as important considerations by the entrepreneurs for locating industries in the area.

The levels of education is found influencing the prospective entrepreneurs' perception in selecting the location for one's industry. While the entrepreneurs having a comparatively lower level of education considered 'home land' as an important consideration for selecting the industrial location, those having higher level of education and technical education weighed other factors too like infrastructure, market, labour, government incentives for locating industries. Outsider entrepreneurs comprehended raw material and infrastructure as important considerations for selecting the location of their industries.

Selection of a Product: An overwhelming majority of the entrepreneurs manufactured products of imitative nature, i.e. these products are the copy of other products already selling in the market. Keeping in view the cumbersome difficulties involved in introducing a new product, only 6 percent of the entrepreneurs claiming originality in their product in a backward region like ours can be considered as an encouraging sign. Those who claimed improvement in their products, i.e. alterations in the products already selling in the market with a view to add utilities in the product accounted for 12 percent only. The

production of the new products by the entrepreneurs having nontechnical education, however, goes against the common belief that
those who have technical qualification would be much shead in
designing a new product as compared to those who have acquired nontechnical qualifications. One possible reason for this paradox may
be the non-availability of local resources like man, machine and
material, on the one hand, and dearth of market, on the other, for
the new products that the technical entrepreneurs can introduce.

Compared to the local entrepreneurs, the greater tendency to produce
a new product by the entrepreneurs coming from distant places goes
to validate the popular hypothesis that the migrant entrepreneurs
are more innovative than the local entrepreneurs.

Expectedly, the manufacturing of consumer products is found prominent (in 70 percent cases). The ancillary type of production, however, received low significance mainly due to the almost a non-existence of large scale units in the region where a few units were started only recently. Whatever ancillary units were in operation, most of them branched out from the main units as small ancillary units in the expansion programmes of the main units. The migrant entrepreneurs option for ancillary products deciphers that migrant entrepreneurs, due to their entarged business contacts, took the view that the manufacturing of ancillary products is more promising for them than the production of consumer goods.

Ownership Forms: The entire sample represented four different forms of ownership, namely, sole proprietorship, family proprietorship partnership firm and the private limited company. Whatever might be

the form of ownership, a strong tendency among the entrepreneurs to confine the ownership within the purview of one's own family is apparently noticed mainly for two considerations: (1) The ownership form restricted to the entrepreneurs' family alone will assure the smooth running and continuity of their units. (ii) Such ownership structure will also help in minimizing the tax burden and also in maintaining the family ties. Thus, the ownership structure of units is guided mainly by the kith and kin consideration not by the rationale behind the various ownership forms. The partnership type of ownership was more prominent in the trading castes again due to the same tax consideration as stated earlier. Since the private limited type of ownership requires relatively a more formal way of operation, it is therefore, mainly preferred by the entrepreneurs who have acquire(higher levels of education.

project report of the proposed unit was prepared as an important pre-requisite for obtaining financial help from the financial agencie. Those who, in fact, were not in need of seeking financial assistance did not prepare project report. The entrepreneurs with higher levels of education were highly convinced that the preparation of project reports helped them in promoting their units.

#### Financing of Entrepreneurship

Entrepreneur's Own Share: A relatively smaller number of the entrepreneurs (42 percent) relied, exclusively or mainly, on their own funds which tended to decline alongwith their occupational hierarchy. The outsider entrepreneurs invested as their own share

more than the local entrepreneurs. The possible reason for this could be either the relative smaller size or their more dependence on institutional borrowed capital. The entrepreneurs' reliance on the friends and relatives for the purposes of meeting funds was found to be rare because of their unwillingness to divulge what they consider secret information to others, especially friends and relatives for reasons of personal esteem-

entrepreneurs (54 percent) mainly belonging to non-business background relied, exclusively or mainly, on financial institutions for arranging their initial long-term capital as is indicated by a very low properatory ratio, an airpear value. Thus, it seems that the financial and developmental institutions are attracting the prospective entrepreneurs to industry from a wide miscellancy of backgrounds. In maximum number of cases, less funds were released to the entrepreneurs than they had asked for, mainly due to submission or faulty project reports. The gaps in such cases were made good by borrowings from friends and relatives as a last economic resort.

### Entrepreneurial Performance

Exemption of Units: The average time, i.e. 9.4 months taken by the entrepreneurs to complete the promotional formalties was found murkedly influenced by the entrepreneurs' education and family background. This may be attributed to the formal and informal contacts of businessmen fathers with different promotional departments, on the one side, and the better ability of the educated

entrepreneurs to communicate properly with the various authorities which play the function of role partners in completing the amorphous formalties, on the other. However, our data did not support the view that entrepreneur's prior knowledge about the promotion procedure and formalties helped them in completing the promotional stage quickly. According to this study, tact and efficiency are also required as a necessary condition to complete the formalties within a shorter span of time. Expectedly, such tact and knowledge is likely to be more with those having business family background and the higher levels of formal education than those who do not.

The study revealed that most of the entrepreneurs (nearly 70 percent) completed various promotional formalties on their own and a few (12 percent) sought help from the developmental agencies for this purpose. This indicates that though the government has been trying to give all possible patronage to small entrepreneurs, the functioning of its promotional agencies still leaves much to be desired. Nearly two-third of the entrepreneurs reported delays in promotion stage mainly due to the lukewarm attitude of the promotional agencies, on the one hand, and lengthy formalties to be completed, on the other. At the same time, the entrepreneurs own mistakes like submission of wrong feasibility reports and their inability to deposit required securities and collaterals were also found no less responsible for delaying the completion of promotional procedures.

<u>Production Performance</u>: An overwhelming majority of the entrepreneurs (even more than 75 percent) supervised the production process themselves more especially by those having higher levels of

education and those belonging to the business background. This deciphers that either the production process is not likely to be too complex necessitating the small entireprenents to employ hired managers on these small emits have not been capable enough to pay high relaties to the professional managers for this purpose.

Another important finding is that even those especially educated entrepreneurs who have employed hired managers did not delegate powers to them to take decisions regarding production activity.

is more prominent in the ancillary units and in anticipation of demand in the units manufacturing consumer goods, the data revealed that the production in anticipation of demand was equally prominent in the majority of ancillary units also enjoying an effective demand for their products. Expectedly, the production in anticipation of demand was much prominent among the entrepreneurs of business castes having other alternative resources to bear the rinks involved in this manner and production on orders among those who lack in such alternative resources.

be bad as nearly nine-bookh or the mains have been utilizing installed capacity even less than 50 percent, thus, reflecting the various odds faced by them in their production function. Both the entrepreneurs' education and argustion distance are found believe in achieving higher levels of capacity utilization which again go to validate the popular hypothesis that the educated and microscoperate. The majority of the entrepreneurs alleged to the located

availability of row material, market problem and problems of working capital in that order as factors discouraging to capacity utilization.

Sales Performance: The average yearly terrover was found. considerably varying between the hills and the plains for which differences in scope for merboling between the two was attributed. However, the relationship between sales performance and the formal level of entrepreneurs' admostion was found negative. The reason attributable to this is that the people qualified formally are not actually so much competent in sales activity as the experienced ones. The date also revealed that socio-economic background of the entrepreneurs' family as indicated by the fathers' occupation did not help the entrepreneurs in improving their sales. Two explaintains for this could be : (a) the performance in sales is influenced by . the pattern of activity undertoken by the entreprendurs themselves, and (b) the entrepreneurs coming from non-business background primarily due to their incerest and capability, have higher orientetion and commitment Usen those bailing from business background who: enter entrepreseurable not mecessarily due to their interest and capabilities for because they inherit certain advantages (Fhanka 1989 \$ 61). Very possibly, it is for this reason that they form a majority among the entropyreness in India.

to the Freeza rivinger mainly for to jobs play the former's enlarged contects with the pursues surjects resistance with the pursues our since resistance resistance with the pursues our since resistance with the pursues our since resistance with the pursues our since resistance.

conversing, i. . something their products due to reasons take

abundant demend, fixed customers, etc. Those who advertised their products used medias having local/limited communication spread effect like local newspapers, magaines, cinema slides and calendars, in general, rely on local sale of their products. The tendency to advertise one's product was found apparently increasing with the formal education of the entrepreneurs.

Departmental sales fratured only in those fewer units which have been manufacturing goods on orders. The majority of the entrepreneurs having departmental sales offered adverse comments like delayed and irregular payments from the government departments.

### Entrepreneurial Problems

identified as the main problem faced by the units especially those using local-base rew material like lisa, mineral, wool in the operation of their units. The problem of markegt ranked the next major one in series of problems. Either the failure of small enterprises to compete with large and medium scale industries in marketing their products or the changing demands of the parent units have been traced out as the main reasons posing market problems for the products manufactured by the small scale enterprises. The parenty of liquid resources, i.e. working capital has been identified as yet another main problem encountered by small scale industries in their day-to-day operation. The origin of this problem is traced out mainly to the uncovourable credit policy practiced by the small units. This is, in fact, due to their sheet help excepts.

availability of a

### Folicy Implications

On the basis of above mentioned findings, the following implications emerge:

At present, the peckage of incentives is available to the hills on the same basis as all other industrially backward plain areas in the country or the state as the case may be. The only extra incentive given to the industrially backward hill areas consists of the transport subsidy. The fact remains that due to the cumbersome difficulties involved in availing transport subsidy. the entrepreneurs do not find the benefits worth the trouble. Not only that, transport subsidy at present is not available for transport within the hills. If an industry procures some material from the hill areas, it cannot avail transport subsidy. This provision appears anomalous for two reasons. First, it discourages the use of inputs from the hills in industries established there. Secondly, it neglects the putstanding fact that transport costs account for higher in the hills than in the plains for comparable loads and distances. It will, therefore, be logical to allow transport subsidy within the hills also. Besides, in view of difficult topography of the hills, nobody will be tempted to set up his/her industry in Fitheragarh district, i.e. the interior hills instead setting up industry in Kashipur tahsil, i.e. the developed plains, for example, to eveil the same incentives. This is, in fact, the reason, for heavier concentration of industries in the plains region of Kumaun in the recent yesteryears.

A significant majority of the entrepreneurs rendering opinion on incentives favoured only a single incentive scheme as against the multifarious on going incentives. The implicit rationals behind it is that, firstly, the nature of some incentives helps the

entrepreneurs only in ways other than reducing the capital cost, and secondly, one often gets very small amount by way of help after approaching a number of agencies and wasting a lot of time. As such, a single incentive from a single agency, with a substantial amount of finds would desinitely help more in attracting and inducing larger number of entrepreneurs from a wider miscellancy as compared to multiple indentives provided by various agencies each providing only a small amount of specific help. It is, thus, desirable to evolve such a segionalised scheme of incentives to a few which can provide what the entrepreneurs are looking for to a more substantial amount.

is, it is felt, largely due to the lukewarm and bureaucratic attitude of the officials in the financial institutions and agencies. In fact, the entrepreneurial approach and the bureaucratic approach are two contrasting approaches in the sense that whereas the former is characterised by 'doing things' in a different way, the latter is baptized by 'doing things' in a routine way. It generally results in a built-in conflict between the two. however, the officials should not consider it as their mercy upon the entrepreneurs but as entrepreneurs' dues to be made available them.

It is, therefore, suggested that the developmental agencies should be helped by a team of experts in the fields of banking, finance, accounting, entrepresentable, management, etc. so as these institutions can have a more realistic understanding of the entrepre-neurial problems to solve them more sympathetically. This team of experts will evaluate the economic feasibility of the proposed coins

as well as identify the prospective entrepreneurs. It would also help in resoving the unpelabeble bureaucratic attitude infusing in the promotional acondies, on the one hand, and in extending the necessary help only to those who have evinced entrepreneurial orientation, on the other.

At present, 586 sil-louis and state level financial institutions and the public sector banks spread over various parts of the country have been conducting Entry renewrants Development Programmes (EDFs) with an objective to "identify and develop first generation entreprenents for promoting small scale enterprises: (Matnew 1989: 2074)", Likelsewhere in India, in Kumaun too, since of the candidates attending the MDFs, very few candidates for name sake have been submitting loan applications and eventually hardly anybody has been coming formerd to set up new projects, it implies that a los of from repealed to modify the on going EDPs to identify the right type of entrepreneurs. The credo of EDPs should be to identify one persons with entroprendurial acumen not to fulfil. vehemostly the alloted quote to conduct the targetted RDPs within a specific period of time. Then, all efforts should be geared to the flourishment of such identified entrepreneurs. The government should not take a long sign of relief just by promoting an industrial unit but, like in Germany (Garachenkron 1962:14), should accompany the units from establishment to liquidation throughout all the Vicishitudes of its existence which ald not exist in ladis.

Policiming the Wokinada (Andhra Fradesh) experiment of inducing the sense of need for achtevement through especially designed training programmes. It can be suggested that the entrepresented

school curriculum that would provide a high degree of motivation among the studgents. For this, success stories drawn from history and legends of the indignous cultures to induce in younger minds the sense of "need for sachievement" and yearning to do something after they grow up should be introduced. Also, there must be some system in the covernment level to dissemicate the experience/secret of the successful entrepreneurs especially to those entrepreneurs who have not been able to get success in their endeavours.

In order to lessen the protracted procedural delays, the entrepreneurs should not be required to run from pillar to post, but ell the formalties as desired by the Industries Department for establishment of any industrial unit should be completed at one place which is baptized as 'single window assistance'like in Maherashtra and Karnataka. Such system will save both time and money on the parts of entrepreneurs. Because, multiplicity of agencies operating in the field for dealing with various aspects of industrial development programmes only complicate the situation and load to delay. Moreover, if the existing entrepreneurs open assistance cells in every industrial centre to golde and advise the prospective entrepreneurs about the various formalties to be completed and proper agencies to be a proached for their completion would definitely hasten the promotion stage.

In view of the problem of raw material, two suggestions are conde. First, a detailed and perspicacious survey taking into account all unpalatable aspects should be undertaken by the subject experts to identify the scope for various industries that can be developed

in the division. Second, the government should come forward in a big way to make judicious distribution of whatever raw material is available locally. This can be done by opening of raw material depots by the government at the potential places.

To ensure a viable market for small scale industries, some products exclusively be preserved for the small units. A certain proportion of small units' products should be purchased by the government itself. One way of solving the market problem of small industries may be the setting up of sales centres in line with khadi Gramodyog Commission, by the government at least at district head quarters.

sickness of some promising industries have displayed an unhappy example creating the general impression among the people that entrepreneurship/andustrialisation holds no promise for them.

Setting up of industries is generally viewed as an alternative means of making quick money by the entrepreneurs at the cost of the government in the misnever of hill development. Therefore, it is suggested that a thorough study should be undertaken by the entrepreneurs to locate the exact problems due to which so many projects have either closeder become sick over time in the area.

We feel that unless and until such appropriate action is taken, it would be no more than flagging a dead horse for the government to motivate the people to come forward with new projects.

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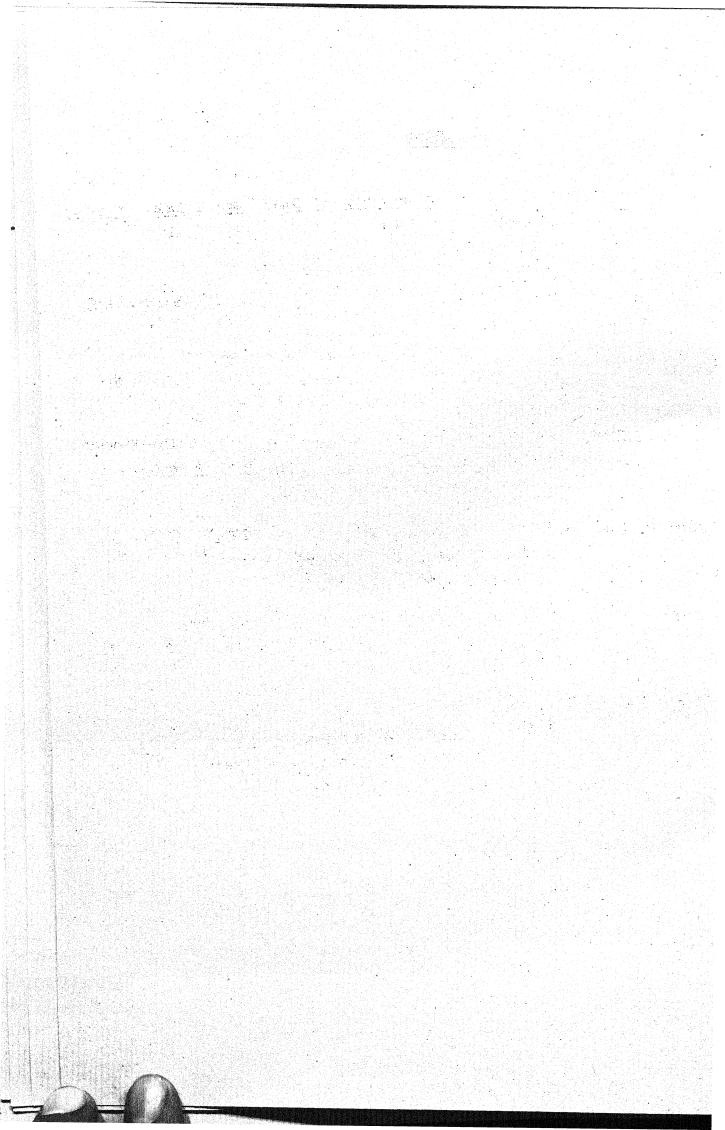
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### ANALYSIS OF SECTORAL TERMS OF TRADE BETWEEN AGRICULTURE AND INDUSTRY IN UTTAR PRADESH

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# ANALYSIS OF SECTORAL TERMS OF TRADE BETWEEN AGRICULTURE AND INDUSTRY IN UTTAR PRADESH

### 1. Introduction

In the process of economic development, interdependence between agriculture and industry increases leading to exchange of commodities (and services) from one sector t the other. In this process of exchange, one of the sectors may extract benefit the other one. This can be analysed with the help of terms trade between agriculture and industry. Some economists are the view that terms of trade should remain favourable for agriculture for its rapid development so that it may transmit growth waves in the economy. Others ae of the opinion that terms of trade should favour burgeoning industrial sector to act as an insentive for rapid industrialization in an agrarian economy. Prominent economists subscribing to the first approach have been Schultz (1964), Mason (1964), Lipton (1968, 1982), Ishikawa (1967), etc. Ishikawa has shown that by deliberately following policies which were favourable to agriculture, Japan was able to achieve rapid industrialization. But in the Soviet Russia, where the first ever debate on sectoral terms of trade took place after the Boleshevik Revolution, Rosa Luxemburg and even Preobrazhenski squeezing pre-socialist agriculture to for were socialistic industrial sector. Lenin also supported this line of argument and suggested that higher surplus could be extracted after technological improvement in the agriculture.

In the Indian economy, Thamarajakshi (1969) seems to have made first ever attempt to analyze systematically the behaviour of terms of trade after evolving the methodology herself. Kahlon and Tyagi (1980, 1983) and later Tyagi (1986, 1988, 1990) also evolved methodology to study the nature of terms of trade between agriculture and industry in the Indian economy. Efforts in this direction have been made by various economists as well by using different techniques. However, at regional level in India, we could not find any study analyzing the terms of trade between agriculture and industry. Here, we shall make an attempt to study the trend of the terms of trade in the economy of Uttar Pradesh. We shall also explore impact of agricultural output on the terms of trade and impact of the terms of trade on the process of industrialization in the State economy. Period of study ranges from 1970-71 to 1989-90 which has been divided into two subperiods: from 1970-71 to 1979-80 as Period I and 1980-81 to 1989-90 as Period II.

### 2. Pattern of Changes in Sectoral Terms of Trade

2.1. Availability of Data: In Uttar Pradesh, Economics and Statistics Division of the State Planning Institute publishes, on regular basis, data relating to agricultural parity index (A.P.I.) which is defined as under:

Index of Prices Received by Farmers

A.P.I. = X 100

Index of Prices Paid by Farmers

Data relating to the agricultural parity i&ndex, which we call as terms of trade between agriculture and industry, is available on the base year of 1957-58, from 1963-64 to 1981-82. Now the new base year of 1970-71 has been adopted and figures on new series are available only since 1980-81. We, therefore, take figures of the A.P.I. during Period I on the base year of 1957-58 while during Period II, figures of the A.P.I. are taken on the base year of 1970-71. Data relating to the production indices agriculture as well as industry are taken on the base year of 1970-71 for the twenty years' period. Whole-sale price indices of agriculture and industry are taken on the base years of 1957-58 and 1948 respectively for Period I. For Period II, whole-sale price indices of agriculture and industry are available on the of 1970-71. However, the figures of base year the manufacturing-SDP, are taken on the base year of 1970-71 for Period I and on the base year of 1980-81 for Period II.

- 2.II. Comparison of Weighting Diagrams of Indices of Prices

  Paid by Farmers: In Chart A, the weights are given on the base

  year of 1957-58 while in Chart B, the weights are presented on

  the base year of 1970-71. Comparison of the two weighting

  diagrams reveals following facts:
- (a) Percentage weight of cash form expenditure to total cash expenditure of the farmer in 1957-58 was 35.2 per cent which declined to 25.07 per cent in 1970-71. This highlights growing share of expenditure on domestic consumption by farmers in Uttar Pradesh.

(b) Farm expenditure in the Sate economy has undergone structural transformation in a manner that modern inputs and machines and tools are being utilized on increasing scale on farming.

Chart A

Actual Weights Used for Agricultural Parity Index
(July 1957-June 1958 = 100).

S1.No. (1)	Items (2)	Weights (3)	% Weights (4)	
Ι.	Domestic Expenditure	1544.94	64.3	
<b>II</b>	Farm Expenditure	839.17	35.2	
	Human Labour	281.09	11.8	
	Bullock Labour	457.37	19.2	
	Upkeep	322.41	13.5	
b.	Depreciation and Upkeep	134.96	5.7	
	Cost of Implements	24.65	1.0	
	Cost of Seeds	63.40	2.6	
(y)	Cost of Manure	3.80	0.2	
(vi)	Land Revenue	6.50	0.3	
(vii)	Irrigation Charges	1.96	0.1	
	TOTAL (I + II)	2384.01	100.0	

Source: Economic and Statistic Division, Monthly Bulletin of Statistics, State Planning Institute, Government of Uttar Fradesh, Lucknow, February 1965, pp. 156-57.

(c) Dependence of the farmers on the biological sources of energy is shrinking while mechanical sources of energy have been now playing crucial role in the agricultural development.

Thus, we can argue that production technique has been undergoing change towards modernization in the agricultural sector of Uttar Pradesh.

Chart B

## Weighting Diagram (Items and Weights) of the Index of . . Farm Business Prices

(Agricultural Year 1970-71 = 100).

31. No. (1)	Input Items of Cash Expenditure (2)	% Weights (3)
1.	Chemical Fartilizers	10.03
1.1	Urea	9.86
1.2	Super Phosphate	0.17
2.	Pesticides and Insecticides	0.75
3.	Livastock Feed	7.95
3.1	Straw	3.42
3.2	Mustard cake	4.33
4.	Depreciation	6.54
4.1	Work Bullock	3.51
4.2	Tractor	1.17
4.3	Diesel Engine	1.08
4.4	Electric Motor	0.17
4.5	Thresher	0.27
4.6	Plough	0.32
5.	Repair and Maintenance	6.54
5.1	Cement	2.14
5.2	In Britch (1992) (1994) (1994)	4.41
6.	Diesel Oil	6.78
7.	Electricity (Agricultural and	
	Maintenance)	2.74
8.	Government Irrigation Charges	4.63
9.	Land Revenue	4,97
10.	Hired Labour	49.06
	Cash Farm Expenditure	100.00
	Per cent Weight of Cash Farm Expenditure to Total Cash Expenditure of the Farmer	25.07

Source:- E. & S. Division, Agricultural Parity Index of Uttar Pradesh - 1980-81 to 1983-84, State Planning Institute, Government of Uttar Pradesh, Lucknow, Publication No. 1.

#### 2.III. Movement of the Terms of Trade

A. Growth Estimates of the A.P.I. : In Table 1 and Table 2, yearly movement of the A.P.I. is presented for Period I and

Table 1
Yearly Movement of Agricultural Parity Index in Uttar Pradesh
During 1970-80

 $\langle July 1957 - June 1958 = 100 \rangle$ .

51. No.	Year	Index of Paid by Farmers		Index of Recieved Farmers	Prices by	Agricul Parity	
		Index	Yearly Movement (In %)	Index	Yearly Movement (In %)		Yearly Movement (In %)
(1)	(2)	(3)	(4)	(5)	(6)	(Ż)	4 ( <b>8)</b>
1.	197071	218.1		205.7		74.3	🌲
2.	1971-72	230.0	5.46	232.5	13.03	101.1	7.21
3,	1972-73	258.9	12.57	287.9	23.83	111.2	9.99
4.	1973-74	312.4	20.66	350.8	21.85	112.3	0.99
5.	1974-75	384.5	22.98	421.8	20.24	109.8	-2.23
ė.	1975-76	346.7	-9.75	321.5	-23.78	92.4	-15.66
7.	<b>197</b> 6-77	23 <b>9.</b> Ż	-2.16	328.0	2.02	96.9	4.64
8.	1977-78	377.0	11.73	358.5	7.30	94.7	-2,27 📤
9.	1978-79	390.0	2.90	347.3	-3.12	89.0	-6.02
10.	1979-30	430.1	. 10.28	438.0	26、12:	101.8	14.38
	Coefficia	ent of Var	iation (lr	n Per cent		7.99	

Source: - From the files of Economic and Statistics Division of the Stati Planning Institute, Government of Uttar Pradesh, Lucknow.

Period II respectively. From these tables, it can be discerned that the index of prices paid by farmers during the 1970s was not growing consistently as there had been wide fluctuations from year to year. The prices to be paid by farmers were growing at very high pace up to the mtd 1970s but afterwards, the burden on farmers seemed to have been moderated. Similarly, the i dex of prices raceived by the farmers was positive and growing at very high rate up to the mid 1970s which also declined afterwards. However, the movement of the p.c.p.a. could also not remain consistent. \* It is found from Table 4 that the A.P.I. remained favourable tro farmers up to the mid seventies but thereafter, it became favourable to the non-agricultural sector. movement of the A.P.I. would reveal that yearly movement had been generally regated indicating adverse trade position of the agricultural sector vis-a-vis, the non-agricultural sector. Table 3 would show that trend growth rate of the A.F.I. was -1.16 per cent per year during 1970-80 despite higher trend growth rate of the index of prices received by farmers (7.10 p.c.p.s.) than trend growth rate of the index of prices paid by farmers (4.54 p.c.p.a.). Thus, it is found that despite higher growth rate of prices received by farmers for their produce than the prices of the products purchased by farmers, growth rate of the terms of the trade remained significantly negative in Uttar Pradesh.

After the seventies, during 1780-70, it is found from Table that yearly movement of the index of prices paid by farmers was positive and consistent with lower fluctuations. On the other hand, yearly movement of the yearly index of prices recoved by

farmers in the 1980s was also not consistent though it had somewhat lower fluctuations than what was in the 1970s. But the yearly movement of the A.P.I. was fluctuating widely. In most of the years, movement remained negative signifying scenario of adverse terms of trade suffered by farmers during Period II as

Table 2

Yearly Movement of Agricultural Parity Index in Uttar Pradesh

During 1980-90

(July 1970-June 1971 = 100).

S1. No.	Year	Year Index of Paid by Farmers		Prices Index of Received Farmers		Agricultural Parity Index	
		Index	Yearly Movement	Index	Yearly Movement	Index	Yearly Movement
(1)	(2)	(3)	(in %) (4)	(5)	(in %) (6)	(7)	(in %)
1.	1980-81	233.1		261.5		112.2	
2.	1981-82	248.8	6.74	242.3	-7.34	97.4	-13.19 🏚
3.	1982-83	272.4	9.49	246.3	1.65	70.4	-7.19
4.	1983-84	292.3	7.31	276.6	12.30	94.6	4.65
5.	1984-85	307.3	5.13	280.4	1.37	91.2	-3,59
Ġ.	1985-86	336.2	9.40	303.6	8.27	70.3	-0.99
7.	1986-87	355.8	5.83	327.6	7.91	92.1	1,99
8.	1987-88	390.6	9.78	392.4	19.78	100.5	
9.	1988-89	415.6	6.40	388.5	-0.99	73.5	9.12
10.	1989-90	455.1		411,4	5.89	90.4	-6.97 <b>&amp;</b> -3.32
·	Coefficie	nt of Varia	ation (In	Per cent)		6.81	**************************************

Source:- Economics and Statistics Division, Agricultural Parity Index (New Series Base Year 1970-71), State Planning Institute, Government of Uttar Pradesh, Lucknow. Bulletin Nos. 1,2,3,6 & 7 Well after soffering the adverse terms of trade duringe Period I. As against 1970s, trend growth rate of the index of prices paid by farmers in Uttar Pradesh was higher (7.60 p.c.p.a.) than the index of prices received by faremrs (6.44 p.c.p.a.) during 1980-

Table 3

Trend Growth Rates of Agricultural Parity Index in Uttar Pracesh

S1. No.	Period		Trend Grow! Rate (% per year)	
(1)	(2)		(4)	
1.	1970-71 to 1979-80	Index of Prices Paid by Farmers	4.54*	
Z.,		Index of Prices Recieved by Farmer	s 7.10*	
3.		Agricultural Parity Index	-1.16*	
4.	1980-80 to 1989-90	Index of Prices Paid by Farmers	7.60*	
E5		Index of Prices Recieved by Farmer	s 6.44*	
6.		Agicultural Parity Index	-1.08 <sup>#</sup>	

Notes:- \*: Significant at 5 per cent level orat lower level. #: Significant at 10 per cent level.

- 90. But like the 1970s, trend growth rate of the A.P.I. during the 1980s remained negative and statistically significant (-1.08 p.c.p.a.). However, estimate of the coefficient of the variation of the A.P.I. was lower in the 1980s (6.81 per cent) than that in the 1970s (7.99 per cent).
- B. Growth Estimates of the Whole-Sale Price Indices: To corroborate above analysis regarding deteriorating situation of the terms of trade in Uttar Pradesh, we have estimated whole-sale

price indices of agricultural and industrial commodities. During Period I agricultural whole-sale price index is on the base year of 1957-58 whereas the industrial whole-sale price index is on the base year of 1948. These are presented in Table 4. We have

Table 4

Movement of Whole-Sale Price Indices of Agricultural and Industrial Commodities

S1. No.	Year	Agricultural Whole-Sale Price Ir (1957-58 = 100)		Industrial ndex Whole-Sale Price Index (1948 = 100)		
(1)	(2)	Index (3)	Yearly Movement (in %) (4)	Index (5)	Yearly Movement (in %) (6)	
1.	1970-71	205.7	AND THE THE	220.2	namen militari sa mana militari sa mana mana mana mana mana mana mana m	
2.	1971-72	232.5	13.03	222.2	0.91	
3.	1972-73	287.9	23.83	286.3	28.85	
4.	1973-74	350.8	21.85	231.1	15.65	
5.	1974-75	421.8	20.24	431.7	30.38	
6.	1975-76	321.5	-23.78	412.0	-4.56	
7.	1976-77	328.0	2.02	426.7	3.57	
8.	1977-78	358.5	0.15	439.8	3.07	
9.	1978-79	347.3	-3.12	391.6	-10.96	
10.	1979-80	438.0	26.12	406.6	3.83	

Compound Growth Rate (Per cent per year)
1970-71 to
1979-80 8.76 7.05

Source:- From the files in the E. & S. Division, State Planning Institute, Government of Uttar Pradesh, Lucknow.

not derived a series of the terms of trade from these indices as the two indices are on two different base years. However, it is estimated during 1970-80, annual compound growth rate of the agricultural whole-sale price index was 8.76 per cent which was

Table 5

Terms of Trade in Uttar Pradesh as Obtained from Whole-Sale Price Indices of Agriculture and Industry

(All at Base Year of 1970-71).

S1. No.	Year (2)	Whole-Sale Price Index of Primary Commodities		Whole-Sale Price Index of Manufac- turing Commodities		Terms of	f Trade
(1)		Index (3)	Yearly Movement (in %) (4)	Index (5)	Yearly Movement (in %) (6)	Index (7)	Yearly Movement (in %) (8)
1.	1980-81	234.2		252.3		39.3	
2.	1981-82	246.6	5.29	274.7	4.73	89.8	0.56
3.	1982-83	246.9	0.12	277.4	0.98	89.0	-0.89
4.	1983-84	275.9	11.75	293.0	5.62	94.2	5.84
5.	1984-85	288.4	4.53	328.0	11.95	87.9	-6.69
۵.	1985-86	302.2	4.79	360.1	9.79	83.9	-4,55
7.	1986-87	334.7	10.75	357.2	-0.25	93.2	in.O8
8.	1987-88	390.4	16.64	381.2	6.18	102.4	9.87
9.	1988-89	404.1	3,51	425.7	11.67	94.9	-7.32
10.	1989-90	408.6	4.11	492.2	15.62	83.0	-12.54
	Compound G	rowth Rat	e (Per cen	t per ye	ar)		
	1980-81 to 1989-90	6.38		7.24		-C. 61	

Source: - E. & S. Division, State Planning Institute, Government of Uttar Pradesh, Lucknow.

higher than the annual compound growth rate of the industrial whole-sale price index. The latter was 7.05 p.c.p.a. during 1970-80. This tendency was similar to the higher growth rate of the index of prices recieved than growth rate of the index of prices paid by farmers during the 1970s.

For the period 1980-90, whole-sale price indices for the primary commodities and the manufacturing commodities in the State economy are available on a common base year of 1970-71. We have derived from these indices a series of terms of trade using following formula:

Terms of Trade =

Whole-Sale Price Index of Primary Commodities

X 100

Whole-Sale Price Index of Manufacturing Commodities

These are presented in Table 5. Like in the case of the growth pattern of the index of the price paid and the index of the price received by farmers during the 1980s, the whole-sale price index of the manufacturing commodities registered compound growth rate of 7.24 p.c.p.a. during the 1980s and it was higher than 6.38 p.c.p.a. growth rate estimated for the whole-sale price index of primary commodities. Compound growth rate of the terms of trade, as estimated from the whole-sale price indices, was -0.81 p.c.p.a. during Period II. Thus, we find that farmers in the State economy were suffering from adverse sectoral terms of trade for two consecutive decades.

### 3. <u>Relationship between Agricultural Parity Index and Agricultural Production Index</u>

In a developing economy, it is argued that change in agriculture scenario paves the way for higher agricultural production. This higher agriculture output may turn terms of trade against the agricultural sector. We have estimated impact of agricultural production (volume) index on the agricultural parity index in Uttar Pradesh with the help of regression estimates for Period I as well as Period II.

Period I (1970-80):

 $\log \ \text{agri.pro.} = 3.1325 - 0.5760 \log A.P.I.$ 

(3.3670)

 $R^2 = 0.617$ 

agri.pro. = agricultural production (volume) index (1970-71= 100)

A.P.I. = agricultural parity index (1957-58 = 100)

Figure in bracket is t-value which is significant at 1 per cent level.

Period II (1980-90):

log agri.pro. = 2.7679 - 0.3617 log A.P.I.

(2.2410)

 $R^2 = 0.388$ .

agri.pro. = agricultural production (volume) index

(1970-71 = 100)

A.P.I. = agricultural parity index (1970-71 = 100)

Figure in bracket is t-value which is significant at

10 per cent level.

Thus, it is estimated that the agricultural output in Uttar Pradesh had significant bearing on the terms of trade and increase in the agricultural output led to deterioration in sectoral terms of trade against farmers.

### 4. <u>Relationship</u> between <u>Industrial Production</u> and <u>Agricultural Parity Index</u>

It is argued that in a developing economy, movement of sectoral terms of trade against the dominant agricultural sector and in favour burgeoning industrial sector would squeeze resources from the agriculture and this would be trnsferred to the industrial sector. If we test this argument in the context of the economy of Uttar Pradesh, we find that favourable scenario of the terms of trade to the industrial sector did boost the process of industrialization. We have tested the argument by taking manufacturing income of the State economy and industrial production index separately as independent variables and the A.F.I. as explanatory variable in the regression estimates for the two different time periods.

Period I:

a. log manu-sdp = 3.9440 - 0.6522 log A.P.I.

(0.9231)

 $R^2 = 0.241.$ 

manu-sdp = Manufacturing-SDF (1970-71 = 100)

A.P.I. = Agricultural Parity Index (1957-58 = 100)

Figure in bracket is t-value which is not found significant even at 10 per cent level.

b. log I.P.I. = 4.8022 - 1.3478 log A.P.I.

 $R^2 = 0.222.$ 

I.P.I. = Industrial Production Index (1970-71 = 100)

A.P.I. = Agricultural Parity Index (1957-58 = 100)

Figure in bracket is t-value which is not found significant even at 10 per cent level.

Period II:

a.  $\log \text{ manu-sdp} = 7.0981 - 1.9000 \log A.P.I.$ 

(4.7353)

 $R^2 = 0.306.$ 

manu-sdp = Manufacturing-SDP (1980-81 = 100)

A.P.I. = Agricultural Farity Index (1970-71 = 100)

Figure in bracket is t-value which is significant at 10 per cent level.

b. log I.P.I. = 7.1129 - 2.3500 log A.P.I.

(1.8688)

 $R^2 = 0.303.$ 

I.P.I. = Industrial Production Index (1970-71 = 100)

A.P.I. = Agricultural Parity Index (1970-71 = 100)

Figure in bracket is t-value which is significant at 10 per cent level.

We can, therefore, argue that in the State economy, favourable terms of trade to the industrial sector did play a role conducive in industrialization of the State. The favourable situations seem to have acted as incentive in the

industrialization process which turned stronger and statistically significant during the eighties after showing weak but inverse relationship between industrial growth and sectoral terms of trade during the seventies.

#### 5. Conclusion:-

Above analysis of the terms of trade in the economy of Uttar Pradesh reveals that farmers have been at the receiving end. The industrial sector has been getting favourable response from the terms of trade. However, it is derived that favourable terms of trade to the industrial sector has been due to inverse relationship between terms of trade and agricultural output during the decades of the seventies and the eighties. Thus, we can also argue that agricultural output growth would lead to industrial expansion by tilting the terms of trade against the farm sector in the economy of Uttar Pradesh.

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INTER-DISTRICT DISPARITIES AND DECENTRALISED
PLANNING IN UTTAR PRADESH \*
B.M. Joshi \*\*

Decentralisation of the planning process below the state level has always been one of the objectives of our five year plans both at the national as well as the state level. It was thought that investment programmes more specifically tailored to the narticular needs of each area could be evolved through people's participation and implemented with the active involvement of people if the planning process was taken to the lower levels.

In India, decentralisation of the planning process has been tried with varying degrees of enthusiasm. Various experiments have been made in the past based on different considerations and some have been given up when they failed to achieve the desired objective.

The thinking about decentralised planning was mainly guided by the recommendations of various committees appointed at the national as well as the state level. The Balwant Rai Mehta Committee (1957), Ashoka Behta Committee (1977), M.L. Dantwala Committee (1978) and lately C.H.H. Rao Working Group on District Flanning (1984) are worth mentioning in this regard. The Planning Commission also issued defailed guidelines on the methodology of the preparation of district plans as far back as 1969.

Many states did try to operationalise the scheme of decentralisation of the planning process to the sub-state level. Gujarat and Maharashtra took the lead in this direction. Other states also adopted this scheme and now many states, such as U.P., West Bengal, "arnataka, Andhra Pradesh and J. & K. have also started the process and are

<sup>\*</sup> The views expressed in this paper are personal and not the views of the Department with which the author is associated. 
\*\* Joint Secretary, Finance Department, Government of U.P.

at different stages of decentralisation. On the whole, the pace towards decentralisation among states is very slow and uneven.

The scheme of decentralised planning introduced in Uttar Pradesh had a two fold objective : to remove interintra-district disparities and to give every district an opportunity to attain full development taking into consideration its potential, available manpower and other resources. In U.F. too the pattern of development has not been uniform across the state where marked inter-regional and interdistrict disparities continue to persist. Though these disparities have existed for long, they are recognised as a political and oconomic problem requiring state intervention, particularly since the third five year plan. Since then, it has been increasingly realised that the disparities can be minimised if planning is done at a more disaggregated level. In this way, decentralised planning is expected to narrow down the wide disparities between the levels of juvil ont attained by different districts.

Under this system, the districts were assigned certain schemes classified as district sector schemes and a specified amount of money on the basis of a formula was provided. They were asked to prepare the district development plans for these schemes within the plan ceiling so indicated. Two committees, one under the chairmanship of the district magistrate and the other under the chairmanship of a member of the council of ministers, were constituted to prepare and approve the district plans. The plans so prepared at the district level and recommended by the divisional committees were finally approved at the state level and

incorporated in the budget. In the process, cortain powers have also been delegated at the district level.

This scheme has been in operation for more than five years now. It is high time now to see whether any success has been achieved in removing of inter-district disparities. An attempt has been made in this paper to examine whether there has been any appreciable impact of the decentralised planning process in the reduction of disparities in the levels of economic development in the districts. The study has been conducted at two points of time, viz., 1980-81 and 1985-86. It is based on secondary data taken from various official publications. We examined the trends in the magnitude of inter-district disparities in the various indicators of development. For the purposes of analysis as many as 27 indicators have been used reflecting diffurent aspects of economic development and socio-

For the sake of analysis, the districts have been classified according to the level of development in relation to the state average with respect to different indicators.

This classification has been done on the following basis:

Very high - Values more than 25 per cent above the state average.

High - Values up to 25 per cent above the state average.

Low - Values to 25 wer cent below the state average.

Very low - Values more than 25 per cent below the state average.

The distribution of districts according to the level of development with respect to different indicators has been presented in table-I for the years 1980-81 and 1985-86.

Table-I
Distribution of Districts by Relative levels of Development in Uttar Pradesh in 1980-81 % 1985-86.

(Mos.)

그리지요! 이 기자는 그는 왕, 남자 내가 나는 교체하는 경험 날만					(14.70.)
Sl. Name of Indicator	· · · · · · · · · · · · · · · · · · ·	Rola Very	tive lev High	rel of a	development Very
		high	5		low
2	a Lawie , micerae	3	4	5	6
1. Net domestic output per (	a) b)	9 6	12 11	23 21	12 18
2. Value of agricultural ( produce per worker	a) b)	11	11 8	19 22	15 23
3. Gross value of agricul- tural output per capital		13 8	8 <b>10</b>	22 11	13 27
4. Gross value of agricul- tural output per hectare of net area sown		10 7	15 22	23 20	8
5. Value added per indus- trial worker	(a)	14 5	7	7 10	27 36
6. No. of workers engaged in registered factories per lakh of repulation		10 12	5	4	36 37
7. Literacy percentage	(a) (b)	13 13	12 14	24 20	7 9
그리는 그리아 아들은 사람들이 가장하고 있는 것이 되는 것이 되었다. 그리고 있는 것이 없는 것이 없는 것이 없는 것이 없는 것이다.	(a) (b)	14 16	7	6 7	29 27
에 가게 하면 선생님이었다. 게임하면 하는 이러 바다를 하는데 하는 중인도 하다 중에 나를 하는데 되었다.	(a) (b)	5 18	13 14	17 18	21 6
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11. Cropping intensity	(a)	1	33 29	21 23	2 3
12. Agricultural productivity	(a) (b)	9 8	20 19	21 20	6 9
13. % Contribution of Agricultural sector to total NDP	(a) (b)	10 9	3 4	7 9	36 34

14.	% Contribution of Industrial sector to total NDP	(a) (b)	10 9	3 4	7	36 34	T-STATE OF THE STATE OF THE STA
15.	Length of roads per lakh of population	(a) (b)	15 14	9	22 22	10 14	Message de la
16.	Length of roads per 1000 sq.km. of area	(a) (b)	17 15	9 12	19 19	11 9	27 200
17.	% of villages situated within 3 km. of pacea road		9 10	19 14	19 23	9	le Carthelle
18.	No. of tubewells and pumps sets per '000 hectares of net area sown.	(a) (b)	16 15	6	10 10	24 25	Macrosthay
19.	Electrified villages a percentage of total populated villages	as(a) (b)	16 15	11 13	13 14	16 14	
20.	Por capita consumption of power	(a) (b)	9 12	7	2 4	38 38	-
21.	No. of banks per lakh of population	(a)	21 5	12 18	11 25	12 8	летися
22.	No.of junior basic schools per lakh of population	(a) (b)	12 12	18 15	23 25	3 4	MARTINA S
23.	No.of senior basic schools per lakh of population	{e} b}	16	8 9	22 22	7	Marina Na
24.	No. of higher secondar schools per lakh of population	<del>{</del> ;}	1.3 1.4	1 <u>1</u> 9	17 19	15 14	
25.	No. of all pathic hospitals/dispensaries per lakh of population		11 10	9 8	21 20	15 18	
26.	No. of beds in mospital dispensaries per lakh of population		18 18	<u>4</u> 2	5 4 ·	30 32	
27.	No. of veterinary hospitals per lakh of livestock population	$\binom{\triangle}{d}$	<b>8</b> 9	19 17	25 27	4 3	

Table I reveals that the pajority of the districts are below the state average in most of the selected indicators. In

1980-81, in 22 out of 27 indicators, more than 50 per cent of the districts were below the states average and in 1985-86 also the number of districts below the state average has not changed and more than 50 per cent of the districts are below the state average in most of the indicators selected for the study.

In each of seven indicators, the number of districts in the very low category has sharply jumped in 1985-85 over 1980-81 which indicates that inter-district disparities have tended to widen in respect of those indicators. These relate to NDF, value of agricultural produce per worker, gross value of agricultural output per capita, value added per industrial worker, contribution of industrial sector, road length and health facilities, Thus the backward districts are slipping further backwards especially in these seven indicators of development.

The study of inter-district disparities has been conducted further with the help of co-efficient of variation analysis.

Table II gives the values of co-efficient of variation for inter-district disparities in selected indicators of development.

TABLE-II
Inter-district Disparities in Selected Indicators of Development

eran	of Indicators	Co-efficient of % Change variation				
	1983 - 1981 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984 - 1984	980-81 1	985-86	Over	1980-81	
	1	2	3		4	
I. Mod	erate Range of Co-efficient(	up to 25%	<b>)</b>	Laver & Sec. ( per	THE TERMS TOWN AND ADDRESS OF	
(i)	Cropping Intensity	10.14	9.73	(-)	4.1	
(ii)	% contribution of agricultur sector to total NDF	al 15.02	20.38	(+)	35.7	
(iii)	Irrigation intensity	22,24	21.13	(-)	5.0	
(iv)	% of villages situated withing km. of pucca road	n 24,22				
(v)	Agricultural productivity (Total foodgrains)	24.88	22.91		성상하는 두 사는 것이 없는데 하는데,	

ASSESSMENT OF THE REPORT HEAD OF THE PROPERTY	2	3	an and an	5
II. Medium Range (25% to 50%) (vi) Literacy percentage	26.93	477.38	(+):	1672.6
(vii) Credit deposit ratio		30.69	100	
(viii)Grosc value of agricultural output per hectare of net area sown.	34.59	25.51	(-)	23.4
(ix) Net domestic output per lakh	36.67	30.29	(-)	17.4
(x) Gress value of agricultural cutput per capita	36.89	59.21	(+)	60.5
(xi)Length of reads per 'coo sq.	37.56	32.15	(-)	14.5
(xii) No. of banks per lakh of population	38.82	22.38	(-)	42.4
(xiii) Value of agricultural produce	41.86	(26.22)	(-)	37.4
(xiv) No.cf vetermiary hospitals per lakh of livestock	46.64	32.57	(-)	28.7
(xv) Electrified villages as % of total populated villages	47.06	31.61	(-)	32.0
(xvi) No. of senior basic schools per lakh of population.	47.86	48.86	(+)	2.0
III. High Range (50% to 100%)				
(xvii) No. of junior basic schools per labb of population.	50.10	51.42	(+)	2.6
(xviii)Length of roads per lakh of population	56.87	95.67	(+)	68.2
(xix) % of urban population of total population	67.60	67.94	(+)	0.5
(XX) No. of higher secondary schools per lakh of population	69.14	81.60	(+)	18.0
(xxi) Value added per industrial worker	70.32	69.38	(+)	37.0
(xxii) No.of beds in allopathic hospitals/dispensaries per lakh of population	79.79	76.48	(-)	4.2
(zziii) % contribution of industrial sector to total NDF	86.58	371.59	(+)	329.18
(xxiv) No.ef hospitals/dispensari per lakh of population	es 93.09	103.53	(+)	11.2

(xxv) No. of tubewells and pumpsets per '000 hectares of net area sown

96.94 56.66 (-) 41.6

IV. Very High (More than 100%)

(xxvi) Fer capita consumption of power.

164.66 151.84 (-) 7.8

(xxvii) No. of workers engaged in registered factories per lakh of population

179.25 125.09 (-) 30.3

NOTE: The indicators have been arranged according to the ascending order of values of co-efficient of variation for the year 1980-81.

The values of co-efficient of variation for selected indicators at two points of time show that the extent of inter-district variation is very high. Looking at the values in 1980-81, one finds that out of 27 indicators have been placed in high and very high categories. Only five indicators have a moderate range of disparity. The situation after five years has not changed much. The inter-district disparity with regard to five indicators is in the very high category though earlier, two indicators were in that category. These indicators relate to industry, literacy, health and power facilities. The classification points to the fact that the disparities with regard to industrial development, education and health facilities have increased during this period.

So far as the movement of values of co-efficient of variation over time is concerned, we find that the values have declined in case of 16 indicators and have increased in case of 11 indicators. But the percentage increase is more sharp than the percentage decrease in values. The percentage increase in the value of coefficient of variation is more than 50 per cent in four out of 11 indicators and in two it is 35 per cent and in the rest it is between two per cent to 18 per cent.

But in the case of percentage decrease, it is less than 10 per cent in seven out of 16 indicators and in the rest it is between 10 to 50 per cent. This trend in the movement of values of co-efficient of variation shows that the decline in interdistrict disparity has not been so sharp as in its increase over the years.

The inter-district disparity has been further examined at different levels; one for the 48 plains districts and another for the eight hill districts. This has been done becase of two reasons:

- (a) Planning for the development of hill districts is done separately by the Hill Development Department and a separate sub-plan is prepared.
- (b) There is a difference in the district sector outlay for the hills and rest of the districts of the plains. For hill areas, the district sector outlay is roughly 50 per cent of the total hill-area annual plan while it is hardly 22 per cent of the annual plan for the 48 districts of plains.
- (c) The formula for the allocation of cutlay to districts as well as the classification of schemes is different for hills and plains districts.

Therefore, the study at different area levels will give us a fairly good idea about the impact of the scheme of decentralization. The values of co-efficient of variation is given in table III and table IV.

TABLE III
Inter-district Disparities in Selected Indicators
for 46 Districts of Plains

Name of Indicator	Values of co- efficient of variation.			% Increase
	1980-81	1985-86		
1	2	3		4
Mcderate (up to 25%)	an et en distribution de attribution de attribution de l'activité de l'activité de l'activité de l'activité de			
(i) Cropping intensity	9.70	9.72	(+)	0.02
(ii) % contribution of agricultural sector to total NDP	14.63	20.46	(+)	39.8
(iii) No. of junior basic schools per lakh of population	18.64	19.98	(+)	7.1
(iv) Irrigation intensity	17.13	16.75	(-)	2.2
(v) % of villages situated within 3 km. of pucca road	n 21.17	21.04	(-)	0.6
(vi) No. of hospitals/dispensaries per lakh of population	s 23.72	23.49	(-)	0.07

			2	3	4		
	(vii)	Literacy percentage	23.90	476.15	(+)	1892.2	
	(viii)	Agricultural productivity	24.64	21.48	(-)	12.8	
	(ix)	No. of senior basic schools	24.66	27.31	(+)	10.7	10 American Al
I.M	edium (2	25% to 50%)					
	(x) C	redit-deposit ratio	31.60	26.89	(-)	15.0	
		o. of higher secondary chools per lakh of population	32.04	34.9	(+)	8.9	
		Length of roads per '000 sq.	33.06	25.85	(-)	21,8	
	(xiii)	Length of roads per lakh of population	33.17	31.35	(-)	5.8	
	(xiv)	No. of bonks per lakh of population	34.93	19.12	(-)	45.3	
	(xv)	Gross value of agricultural output per capita	35.03	54.67	(-)	56.0	
	(zvi)	Net domestic output per capita	35.20	28.95	(-)	17.8	
	(xvii)	Gress value of agricultural cutput per hectare of net area sown	35.80	26.24	(-)	26.7	
	(xviii)	Value of agricultural produce per worker	38.97	23.28	(-)	40.3	
	(xix)	No. of veternary hospitals per lakh of livestock population	44.32	19.24	(-)	56.6	
	(xx)	Electrified villages as percentage of total populated villages	45.62	31.35	(-)	31.3	
II.	Eigh (	50% to 100%)					
	(xxi)	% of urban population to total appulation	62.42	62.88	(+)	0.7	
	(xxii)	Value added per industrial worker	64.13	99.00	(+)	54.4	
	(xxiii)	No. of beds in hospitals/ dispensaries per lakh of population	76.7	72.01	(-)	0.2	
	(xxiv)	% contribution of industrial sector to total NDP	80.82	353.76	(+)	337.8	
	(xxv)	No. of tubewells and pumpsets per '000 hectares of net area sown	84.73	<b>37.</b> 06	(-)	56 <b>.3</b> '	

I.

1	2	3	4	MANA, que en relacioner mentrant y consider especial finalment un un managa à l
IV. Very high (More than 100%)	NOT make of the State		A PARENTALIA PERINCIPAL NEL SINGIPALIAN	
(xxvi) Per capita consumption of power	163.75	152.67	(-)	6.8
(xxvii) No. of workers engaged in the registered factories per lakh of population	175.34	121.12	(-)	31.0

NOTE: The indicators have been arranged in ascending order of values of co-efficient of variation for the year 1980-81.

It is evident from the table that the disparities have declined in 17 out of 27 indicators and increased in 10 indicators. The increase is substantial in indicators relating to industrial development, but in the rest of the cases, except in literacy percentage, it is marginal, being less than 10 per cent.

TABLE IV
Inter-district Disparities in Selected Indicators for 8 Hill Districts

Name of Indicator		Value of co-efficient of variation			% Increase		
		1980-81	1985-86				
			antendrici interneta in consumerante interneta in consumera in consumera in consumera in consumera in consumer Consumera in consumera	AP WESTALEN WILLIAMS TO IN U.S. PROPERTY SERVICE STREET	4		
Modera	te (up to 25%)						
(i) C	ropping integnsity	52.24	5.90	(+)	12.6		
(ii)	Irrigation intensity	9.91	11.11	(+)	12.6		
(iii)	% contribution of agricul- tural sector to NDF	13.75	18.67	(+)	35.8		
(iv)	No. of hespitals/dis- pensaries per lakh of population	18.64	19.05	(+)	2.2		
(v)	Literacy percentage	20.35	20.18	(-).	0.8		
(vi)	Length of roads per lakh of population	24.19	27.43	(+)	13.4		

I

				Market Control of the	
e ne en	1	2	3	4	
I. Medi	1 25% to 50%) .				
(vii)	No. of higher secondary schools per lake of population	25.87	29.72	(+) 14.	9
(viii)	No. of senior basic schools por lake of population	25.46	29.46	(+) 11.	3
(ix)	No. of junior basic schools per labb of population	27.95	26.23	(-) 6.2	
(%)	Agricultural producti- vity (total foodgrains)	28.00	29.48	(+) 5.3	
	Gress value of agricul- tural cutput per hectare of net area sown	28.40	29.63	(+) 4.3	
(zii)	No. of banks per lakh of population	32.72	24.53	(-) 25.	0
(xviii)	) % of villages situated within 3 km. of pucca roads	34.20	29.87	(-) 12.	7
(xiv)	Credit-deposit ratio	35.34	37.84	(+) 7.0	
					•
(xv)	No. of beds in hospitals/ dispensaries per lakh of population	36.49	29.05	(-) 20.	4
(zvi)	NDP per capita	43.20	26.27	(-) 39.	2
(zvii)	Electrified villages as % of total populated villages	46.39	34.09	(-) 26.	6
II. Hig!	1 (50% to 100%)		All the Control of th		
(zviii)	) Gross value of agricultural cutput per capita	50.56	51.89	(+) 2.6	
(xix)	No. of voterinary hospitals per lakh of livestock population	51.80	24.65	(-) 52.	4
(xx)	Length of roads per 1000 sq. km. of area	59.25	52.36	(-) 11.	6
(mxi)	Value of agricultural produce per worker	61.65	43.22	(-) 29.	9
(zzvii)	Value sched per	70.29	86.37	(+) 22.	Q

	1 <b>2</b>	3	4
Very High (More than 100%)			
(xxiii) % of urban population to total population	106.55	106.02	(-) 0.5
(xxiv) % contribution of indus- trial sector to NDF	108.19	65.59	(-) 39.4
(xxv) No. of workers engaged in regd. factories per lakh of population	159.76	167.72	(+) 0.6
(xxvi) Fer capita consumption of power	169.50	154.02	(-) 9.1
(xxvii) No. of tubewells and pumpeets per 1000 hectares of net area	221.22	243.29	(+) 10.0
sown			

NOTE: The indicators have been arranged in ascending order of value of co-efficient of variation for the year 1980-81.

In case of the hills, the values have declined in case of 13 cut of 27 indicators while these have increased in case of 14 indicators. In seven out of 14 indicators, the increase has been more than 10 per cent while the decrease in the value of co-efficient of variation in four indicators is less than 10 per cent and in rest of the indicators it is between 10 per cent and 50 per cent.

So far as the range of disparity is concerned, it has increased more in the hill areas than in the plain districts. In the plains, cut of 27 indicators, 20 are in the category of moderate and medium range while in hills, 14 out of 27 indicators are in high and very. high range.

On the basis of the above analysis, the following general conclusions emerge:

- (a) The decentralised planning scheme does not show any marked impact on inter-district disparities in the state as the values of co-efficient of variation do not show any substantial upward movement except in a few cases.
- (b) The trend in disparities with respect to different indicators has not been uniform, as in the case of 16 indicators the value shows a decline, while in case of 11 indicators it shows a rise.

- (c) The extent of inter-district disparity is found to be higher in the mill region as compared to plains.
- (d) Efforts at reducing inter-districts disparities have been less successful in the case of the hill region as compared to the plains region.
- (c) The disparities seem to have increased in the case of the indicators relating to industrial development and social services.

For an lysing to reasons for the above situation, it would be desirable to study some of the critical dimensions of the scheme. The instrumentalities chosen for the realisation of the goal of balanced inter-district development were (a) the allocation of 30 per cent of plan funds for the district sector schemes; (b) the formula giving due weightage to population and backwardness for the devolution of this 30 per cent outlay among various districts.

In purely statistical terms, from the very beginning, it was very optimistic to expect 30 per cent of plan outlay to effect the impact of 70 per cent of the state sector outlay and the entire non-plan outlay. The sectoral rather than the regional approach always guided the allocation of the 70 per cent of the state sector outlay. Its regional break up is not known. The entire non-plan expenditure was outside the purview of the district plans. Further, even the desired minimum of 30 per cent was never achieved as would be evident from table V.

TABLE V
Outlays Allocated to District Sector

(Ps. in crores)

Year	Total plan outlay.	Outlay for district Sector.	District sector % of total plan outlay.
PLAINS			
1. 1962-83	<b>1</b> 08 <b>2.</b> 00	282.56	26.10
2. 1983-84	1235.00	399.03	27.45
<b>3. 2</b> 984 <b>-</b> 65	1435.≎	349.13	24.31
4. <b>1</b> 98 <b>5</b> –8€	1573.00	205.00	24.48
5. 1986-87	<b>1945.</b> 00	441.57	22.70
6. 1987-88	2285.00	503 <b>.</b> 00	22.01

(%. in crores)

Teer	Total Flan Outlay.	Outlay for district sector.	District sector as % of total plan outlay.
Fill Region			ottori – die – weider i der Labergerover des 200 billions (in des periodentes) des periodentes montes (in de
1. 1982-83	120.00	63.01	52.50
2. 1987-84		73.13	52.53
<b>3.</b> 1984-85	165.00	87.25	52.87
4. 1985-86	177.00	94.52	53.40
5. 1986-87	<b>2</b> 05 <b>.</b> 08	106.75	52.06
6. 1987-88	235.00	118.84	50.57
Plains and Hil			
1. 1982-83	1202.00	345.57	28.74
2. 1983-84	1375.00	412.16	29.97
3. 1984-85	1601.00	436.38	27.25
4. 1985-86	1750.00	476.50	27.40
5. 1986-87	2150.00	542.30	25.50
	2520.00	621.84	24.68

There is, thus, less and less allocation of blan funds to the district sector in proportional terms. The amount going to the districts is so meagre as to just barely finance the execution of continuing schemes. It does not leave any scope for the planning authorities at the district levels to take up new schemes which they think are beneficial to their districts. Thus, what is happening is that the districts are being asked to disaggregate outlays on the schemes carmarked by the state and that too according to the guidelines issued by various sectoral departments. As the working Group on District Planning (1984) has righly pointed out, the district blan is purely an aggregate of departmental schemes. It should be noted that the choice of projects to be included in the outlays commissated to the district level support.

The outlay earmorked for district plans was distributed among various districts on the basis of a formula which gives weightage to backwardness apart from population. It was thought that this devolution formula would help in the achievement of the objective of balanced regional development. The formula is given below:-

Si.No. Item	Fer cent alloca	tion
1. Population	50	T ACC ACC ACC
2. Fogulation of SC and ST	5	
3. No. of marginal and landless labourers	10	
4. Backwardness in		
(i) Agricultural production	<b>.</b>	
(ii)Industrial production	5	*
(iii) Roads	<b>5</b> .	
(iv) Allogathic bods in Respitals	5	
(v) Drinking water	5	
(vi) Electrified villages	5	
Tal	95	

A study of the shares of various districts in district wax sector outlays shows that the devolution formula has not produced fully satisfactory results from the point of view of interpojonal equity. This can be traced to some of the weaknesses inherent in the devolution formula:

- (i) In selecting variables representing backwardness, the number of aspects were completely ignored such as the level of per capita district domestic product, educational backwardness, physical handicaps like droughts and floods, etc. In some other states such as Maharashtra and Karnataka due waik weightage has been given to these aspects.
- (ii) Some of the indicators of backwardness are not fully appropriate; for example per capita rather than per hectare output could have been chosen to represent backwardness.
- (iii) All the variables measuring backwardness have been given an equal weight of 50 per cent which is not justifiable.
- (iv) The distribution of three per cent of outlay on the basis of contribution to National Savings is also creating distortions, as the developed districts have benefitted more from this formula.

correspondence between the level of development and the allocation of outlay at the district level. To study this relationship, a composite index of districts has been prepared on the basis of the ranking method taking all 27 variables into xeex account. The rank correlation has been obtained between the xxxx rank ranks of districts on the basis of composite indices on the one hand and average per capita districts plan outlay for the period 1982-87 on the other. Again this exercise has been carried out at three levels, one for the state as a whole second for the 48 districts of plains and third for the eight districts of the hills as shown in tables VI.VII and VIII.

TABLE VI
Ranking of Districts According to Level of Development and Fer Capita Tlan Outlay

Name of district		Ranking of district		
	Outlay	Development		
1. Uttar Kashi	мамуниканан на ;:::::::::::::::::::::::::::::::	25		
2. Champli	2	32		
3. Fithoragarh	3	16		
4. Tehri Garhwal	3 4 5 6	<b>3</b> 8		
5. Fauri Garhwal	5	29		
6. Almora	5 - 10 - 10 - 10 - 10 - 10 - 10 - 10 - 1	21		
7. Nainital	J			
8. Dehradun	8 9	<b>1</b> 6		
9. Jalaun	통하여 (10 m <b>)</b> (10 m )	37		
10. Sultangur	10	40		
11. Hamirpur		51		
12. Lalitpur	12	54		
13. Ballia	10 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	45		
14. Mirzapur	- 14 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	35		
15. Banda	15	46		
16. Besti	16	52		
17. Fratapgarh	17	43		
18. Bahraich	18	56		
19. Kheri	19	39		
20. Budaun		47		
21. Hardoi	21	29		
22. Barabanki	22	33		
23. Decria	23	34		
24. Gonda	24	55		
25. Ree Bareli	25	19		
26. Pilibhit	26	19		
27. Shahjahanpur	27	24		
28. Azangarh	23	<b>3</b> 0		
29. Etawah	29	23		
30 Unnac	<b>3</b> 0	41		
31. Sitapur	31	53		
32. Mainguri	<b>32</b>	시민이라고 <b>2이</b> 그리고 있는데		
33. Jhansi	33	33		

T Bus arready	namen consummanda de la companya de		manus variante sommane en entre des montenamentes en en	arena ar allami entermedurantes en en esta de arres
34.	La Commence de la com	34	42	accessors in the contract of t
	Ghazipur	5 <del>≈</del> 35	50	
35.	Gorakhour	35	28	
<b>36.</b>	Fatehpur			
37.		37	15	
38.		<b>3</b> 8	36	
-	Romaur	<b>3</b> 9	11	
	Etah	40	31	
41.	Mathura	41	9	* .
12.	Jaunpur	42	44	
13.	Bulandshahr	43	5	
14.	Varanasi	44	26	
15.	Allahabad	45	14	
	Eijnor	46	17	
	Bareilly	27	27	
	Moradabad	48	18	
19.	Aligarh	49	8	
	Şaharanpur	50	$\frac{J}{J}$	
	Agra	51	22	
			9	
	Muzaffarnagar	52		
	Lucknow	53	12	
	Ghaziabad	54	3	
55.	Meerut	55	2	
56.	Kanpur	56	10	

TABLE VII
Ranking of District According to Level of Development and Per Capita Plan Outlay(Plain districts)

Name of district	Rank		MAIN LICENSES THAT I THE SECOND OF MALANIA SECONDAL STRAY, TO THE THE SECOND SHOP I WE'VE	
Notice Of distinct	Devologice	nt	Outlay	
1. Meerut		47	waterwise of a see a section to the property and representations	
2. Ghaziabad	2	46		
3. Saharangur	3	42		
4. Bulandshahr		35		
5. Nuzefferneger	4 5 6	44		
6. Aligerh	6	41		
7. Mathure	7 3	35		
3. Yenpur	3	40		
9. Rampur	9	31		
O. Luc mow	10	45		
1. Filibhit	11	13		
2. Allahabad	12	37		
3. Farrukhabad	13	29		
4. Bijnor	14	30		
5. Moradabad	15	ā.		
5. Rao Bereli	15	17		
7. Mainpuri	17	24		
3. Agra	10	43		
J. Etawah	19	21		
. Shahjahanpur	2.	9		
l. Varanasi 💮 🧋	21	* 36		
2. Bareilly	22	<b>3</b> 9	[교육 2명 - 1명 - 1명 명기 : 1명 명기 - 1명 - 1명	
3. Fatchpur	23	23		
1. Azangarh	24	20		
5. Stah	25	<b>3</b> 2		

William Colors	1	2	<u> </u>	ener anna anthropia de la company de la comp
26.		26	25	ALEXANDER EPROPRIAGORIAN CANADA MENTEL CONTRACTOR CONTR
27.		27	15	
	Mirzapur	20	6	
29.	Faizabad	29	30	
<b>3</b> 0•		<b>3</b> 0	1	
31.		31	11	
	Sultanpur	<b>3</b> 2	2	
	Unnac	33	22	
	Ghazipur	34	26	
	Barabanki	35	11	
	Jaunpur	36	34	
	Bollia	37	5	
-	Banda	<b>3</b> 8	7	
39.	Badaun	39	12	
	Partapgarh	40	9	
	Hardoi	41	13	
	Gorakhpur	42	27	
	Hanirpur	43	3	
	Basti	44	8	
	Sitapur	45	23	
	Lalitour	46	4	
47.	Gonda .	47	16	
48.	Bahraich	48	10	

TABLE VIII

Ranking of District According to Level of Development and Fer Capita Plan Cutlay (Hill districts)

Name of districts	Rank Bevelopment	Outlax
makanan makan oli baha sassi sassi sassingga pakanan kangganin makanan kanggani kanggani kanggani sassi sassi	TO A COTO TO TOTAL	O S I I CON
Uttar Kashi	4~ <b>5</b> 2 4 4 4 1 1 1 1 2 2	ja <b>1</b> . godine koj presina
Chamoli	7	[편 <b>2</b> 발발발 : # 26 10 10 10
Pithoragarh		
Tehri Garhwal		
Fauri Garhwal	6	하루다고 하다 하는 사람이 있다.
Almora		: <b>:</b>
Nainital		
Dehradun	2	실 <b>수</b> 하다 하는데 있다면 살아 있다.

Looking at these tables, one does not find a close correspondence between the level of backwardness and the per capita district plan autley. Several districts which are at a lower level of development have received relatively lower plan autley then some better off districts. Mention may be made of Faizabad, Gonda, Bahraich, etc., in respect of the plain districts and Tehri Garhwal and Fauri Garhwal in the case of the Hill districts.

The value of rank correlation is only(-) 0.46 for all the districts taken together. However, when the plain and hill districts are taken separately, the rank correlation comes to (-) 0.7 and (-) 0.6 respectively.

planning mechanism, as adorted in recent years, has not yielded satisfactory results as far as inter-district disparity in various indicators of economic development and secio-economic infrastructure is concerned. This has been so, first, because the everall resources placed at the disposal of the district for plan formulation were too meagre to make any appreciable change in the situation, and secondly the mechanism of devolution of plan funds among districts has certain inherent shorteenings and did not serve the interests of the backward districts to the extent necessary.

In order to make decentralised planning a more effective instrument of balanced regional development, it will be necessary to rectify the above defects. This would require raising the share of the district sector in the divisible peel and secondly apprepriate changes in the formula of develution to give larger weight to backwardness. The anomalies in respect of the share in plan outlay observed at the district level have to be carefully removed.

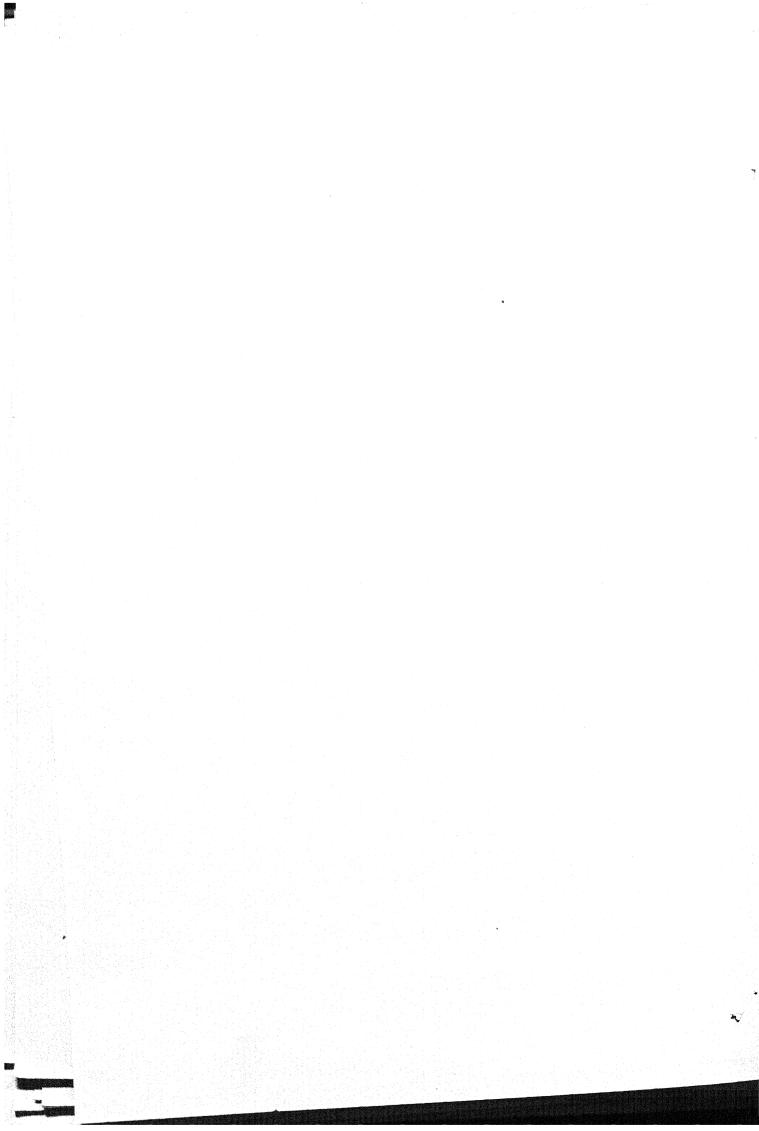
## ALLOCATION OF PLAN FUNDS TO DISTRICTS IN U.P.

AJIT KUMAR SINGH

#### Introduction

The NEPO for decentralized planning has been repeatedly emphasized in Five-Year Plans of India since the inception of planning. However, progress in this direction remained slow and faltering. One of the main reasons for this was that the required procedures and organizations were not set up in the right cannest not were efforts made to operationalize the process of decentralized planning. Some progress in this direction was made after the guidelines for formulation of district plans were provided by the Planning Commission in 1969. In more recent years, particularly since the Fifth Five-Year Plan, concrete steps were undertaken in a number of States, notably Maharashira, Gujarat, Kamataka and Uttar Pradesh, to decentralize the planning process to the district level. These efforts have been examined in detail by the Working Group on District Planning set up by the Planning Commission, which also gave detailed suggestions for operationalizing the process of decentralized planning.

Any scheme of decentralized planning requires a sound mechanism for sharing the resources among the different levels of the planning hierarchy as well as among the different participatory units. In the present article we propose to critically examine the existing mechanism for disaggregation of plan outlays from the State to the district level, drawing upon the experiences of the above-mentioned



4

# Division of Resources Between State and District Plans

The issue needs to be discussed at two levels. First, how much of the total State plan outlay should be carmarked for the district sector plans, and secondly, how the share of each district in the total district sector outlay is to be determined?

Presently, the share of district sector outlay in total State plan outlay is 30 per cent in U.P., 35 per cent in Gujarat, 40 per cent in Maharashtra, and 45 per cent in Jammu and Kashmir. In Uttar Pradesh the figure of 30 per cent was arrived at after examining the existing tevel of outlay on district and State sector schemes. It was found that nearly 53 per cent of the State plan allocation was accounted for by power and major and medium irrigation projects, while another 17 per power and major and medium irrigation projects, while another 17 per cent was spent on other schemes in the State sector, thus leaving a residual share of 30 per cent for the district sector schemes. For the eight hill districts of the State, for which a separate sub-plan is prepared, the allocation between the district sector and the State sector plans' outday is in the ratio of 50:50.

In actual practice, even the proposed share of 30 per cent for the district sector schemes was never realized. In fact, it has gone down from 28.74 per cent in 1982-83 to 25.50 per cent of total outlay in 1986-87. In case of the plain districts the share has gone down from 26.10 per cent to 22.70 per cent over the same period.

Thus, the criterion of adequacy has not been met in case of U.P. as far as the planning for the decentralized sector is concerned. In particular, the existing allocation to the districts has constrained the capacity of the districts to take up new scheme suited to the needs of the area. An exercise by the State planning department revealed that m 1984-85 the proposals for new schemes amounted to Rs. 10.69 crores or only 3.4 per cent of the total outlay for the district sector. In as many as 15 districts funds allocated were not sufficient even to meet the requirements of the on-going schemes, while in another 10 districts only token provisions were made for new schemes.

There is thus a clear case for raising the quantum of flow to the district level at least in the State of U.P. The share of districts in plan outlays has to be commensurate with the planning functions entrusted to them. "But", as argued by the Working Group on District Planning

"any proportion arrived at by a State should not be continued on a permanent basis, but should be constantly watched in a dynamic context and revised".

In this context at the State level powers and functions should be decentralized and gradually transferred to the district level as their capacities for planning are built up. At present when the scarcity of resources at all levels is acute and a large chunk of plan funds has to be devoted to large infrastructural projects, the claims of the State sector cannot be overlooked. We would, therefore, suggest that if the share of the district sector is kept between 35 to 40 per cent of State plan outlay, it would meet the requirements of both desirability and feasibility during the next plan.

## Disaggregation of Plan Funds among Districts

Let us now turn our attention to the second issue, i.e., how the share of each district in the total district sector outlay is to be determined. Here questions of inter-regional equity are involved. The existing mechanism of distribution of plan funds among districts in the States, where the system of decentralized planning has made greater headway, is based upon a multi-indicator formula basically centred around the considerations of population, levels of development and existence of problem areas. Appendix 6.1 gives the details of the distribution formula adopted by the States of Maharashtra, Gujarat, Karnataka and Uttar Pradesh.

In the current thinking and practice consensus has emerged around some general principles which should govern the distribution of outlay among districts. First, it is commonly felt that population alone cannot be a sufficient criterion for allocation of funds and some mechanism should be built into the allocation system to ensure, a more favourable treatment to the relatively backward or otherwise physically handicapped districts. Secondly, there should be some free or united funds at the disposal of the district planning bedies which can be used by them at their own discretion to undertake programmes specifically related to the total needs. Thirdly, the system of allocation must also contain some provision to encourage mobilization of local resources. The implications of these principles need careful consideration.

The use of a multi-indicator formula abounds with many problems for which no simple solutions can be offered. A number of issues are involved here, such as, what indicators should be used? What should



be their relative weights? What should be their specification? Whether sectoral or composite indicators of development should be used ? etc. While every State has to devise its own detailed formula for allocation of plan funds to districts in the light of its own specific situation and priorities, some general observations on these issues are called for.

#### Population

should not exceed 50 per cent, if the problem of backward districts is has also excluded expulation of towns with more than 50,000 for computing the population. This is a sound practice, which other States should also adopt. In our view the weight of population in the formula Karnataka, it is 60 per cent in Maharashtra, where additional weightage Gujarat has given a weightage of only 40 per cent to population and The weightage of population has been kept at 50 per cent in U.P. and of five per cent to urban population is also given. On the other hand, to be tackled effectively.

#### Weaker Sections

in total population and there is much overlap between the two groups The weight given, however ranges from five per cent in Maharashtra to 17.5 per cent in Gujarat. Since these two groups are already included tions, namely, Scheduled Castes and Scheduled Tribes and small and as well, it would be adequate in our opinion to give a weight of 5 per marginal farmers and agriculture labourers (except in Maharashtra). All the four States also give weight to two categories of weaker seccent each to these two categories of weaker sections.

#### Backwardness

dustry, communication and irrigation (except U.P.). The formula adopted in U.P. and Karnataka also takes into account backwardness in health facilities and power supply. In addition, U.P. has made proviindicators of backwardness also vary from State to State. All the four States have given consideration to backwardness in agriculture, incent in Gujarat. The items covered and weights given to different The weightage of backwardness Las been kept at 19 per cent in Maharashtra, 30 per cent in U.P., 35 per cent in Karnataka and 40 per

ALLOCATION QF PLAN FUNDS TO DISTRICTS IN U.P.

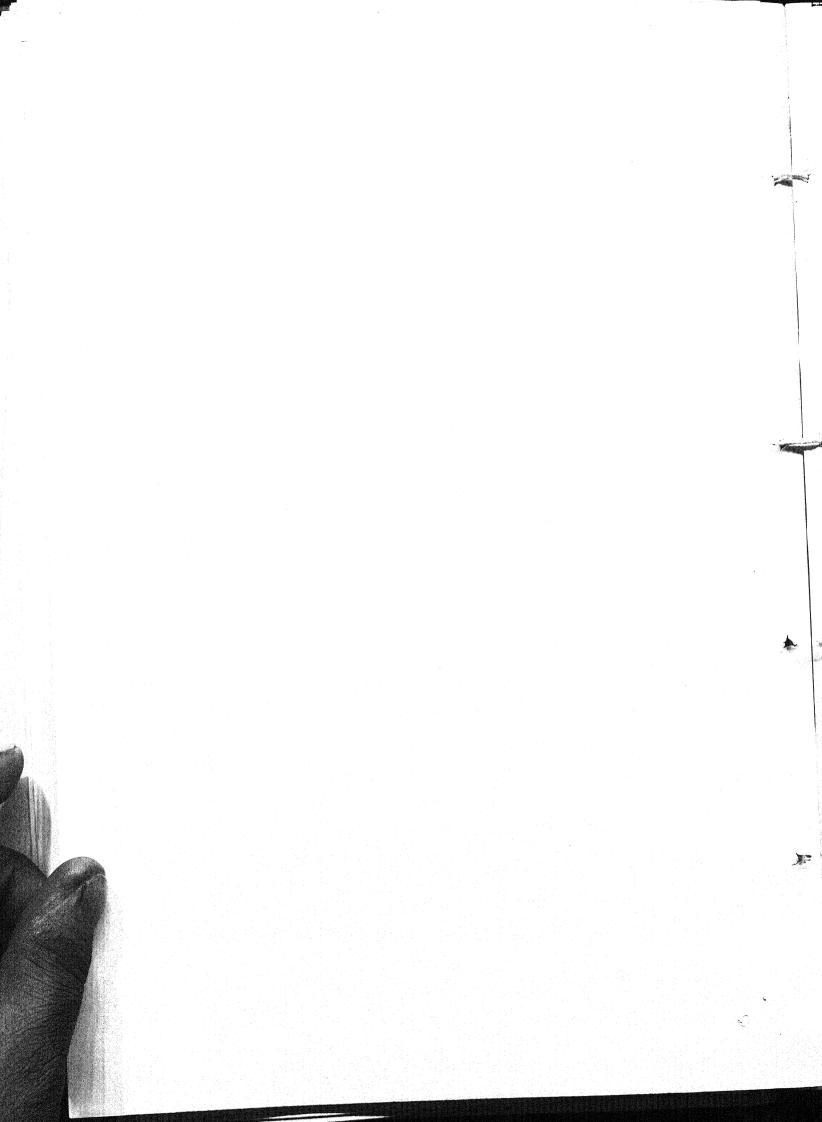
tively, to the special problem areas, but in Gujarat and U.P. there is no sion for drinking water and Karnataka for backwardness in Imancial structure and for incidence of unemployment. Maharashtra and Karnataka have also given a weight of six per cent and 10 per cent respecsuch provision. Surprisingly no State has taken into consideration backwardness in education for allocating plan funds.

backwardness in agricultural and industrial output has been given equal weight of five per cent in Maharashtra, Karnataka and U.P., Gujarat has given a weight of 10 per cent to agricultural backwardness as comof five per cent in the formula for allocation of plan funds. While pared to five per cent to industrial backwardness. Gujarat has also given relatively higher weightage to backwardness in communication In U.P. all aspects of backwardness have been given equal weight than other States.

of backwardness as done in U.P., does not seem justified as it bears no relation to either the contribution of the factors to development or to agriculture and allied sectors (including rural development and minor irrigation) received 51.6 per cent of total outlay as compared to the share of 16.3 per cent for roads, eight per cent for health facilities, six per cent for drinking water facilities, 2.2 per cent rural electrification and two per cent for industries, while all the items were given an equal tem of weights, the practice of assigning equal weights to all indicators the pattern of plan allocation. Thus, in U.P. the study of sectoral allocation pattern under district sector schemes revealed that in 1984-85 While some degree of arbitrariness will always be there in any sysweight of five per cent in the allocation formula.

propriate that the weights attached to different sectoral indicators have If the approach based upon multi-sectoral indicators of backwardness for allocation of plan funds is continued, attempts should be made greater correspondence with the share of those sectors in total plan alto devise a more rational system of weights. It would be more aplocations, which can be taken as an index of the plan priorities.

was found that the value of coefficient of correlation between per capita plan outlay and per capita district commodity output was only periods 1982-83 and 1987-88 reveals that the present formula of allocation is not yielding satisfactory results from the point of view of regional equity. Taking the 48 districts of U.P. plains for analysis, it A study of the per capita plan outlay district wise in U.P. during the -0.1947 and that between per capita plan outlay and composite index of development was -0.6836 (Table 6.1).



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	Х, Х,	-0.1947 -0.6836 1,0000 0.4639 0.4639
TABLE 6.1: Correlation Matrix	¹x	X <sub>1</sub> 1.0000 X <sub>2</sub> -0.1947 X <sub>3</sub> -0.6836

Note: X<sub>1</sub> = Per capita District Plan Outlay 1982-88.

X<sub>2</sub> = Per capita District Commodity output (average 1981-84).

X<sub>4</sub> = Composite Index of Development, 1980-81.

If we compare the per capita district plan outlay of individual districts the unsatisfactory impact of the present formula would be further apparent (see Appendix 6.2). To give a few glaring instances: Fatchpur and Ballia have the rank of 30 and 31, respectively in the composite index of development, but their plan allocations in per capita terms index of development, but their plan allocations in per capita terms Sultanpur, which rank 36th, 37th and 38th, respectively in the composite index of development received plan allocation; of Rs. 190, posite index of development received plan allocation; of Rs. 190, crepancies can be observed on comparing the ranks of districts in per capita output and per capita plan outday.

capita output and the brescut formula of allocation of plan funds. The operation of the present formula of allocation of the present formula of allocation of plan funds among districts in U.P. has tended to favour the backward distribution of plan funds whole, but it does not yield fully satisfactory distribution of plan funds if one looks at inter-district allocation within the developed of backrif one looks at inter-district allocation within the developed of backward group of districts. While some backward districts have benefitted ward group of districts. While some backward districts have benefitted very substantially, others have gained only marginally. Therefore, very substantially, others have gained only marginally. Therefore, there is a need to look afresh into the various aspects of the formula inthere is a need to look afresh into the various aspects of the formula including the variables of backwardness to be taken into account, their relative weights and their proper specification.

#### Alternatives

We may at this stage consider some alternative models for allocation of plan funds among districts to ensure inter-district equity. One approach can be to classify all the districts into different groups according to levels of development and fix certain norms for distributing plan funds for each category giving weightage to backward districts so that funds for each category giving weightage to backward districts so that funds get plan allocations on per capita basis in a predetermined ratio. Following classification and weights may be taken as illustrative of

ALLOCATION OF PLAN FUNDS TO DISTRICTS IN U.P.

this approach:

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Level of Development Very Developed Relatively Developed Less Developed

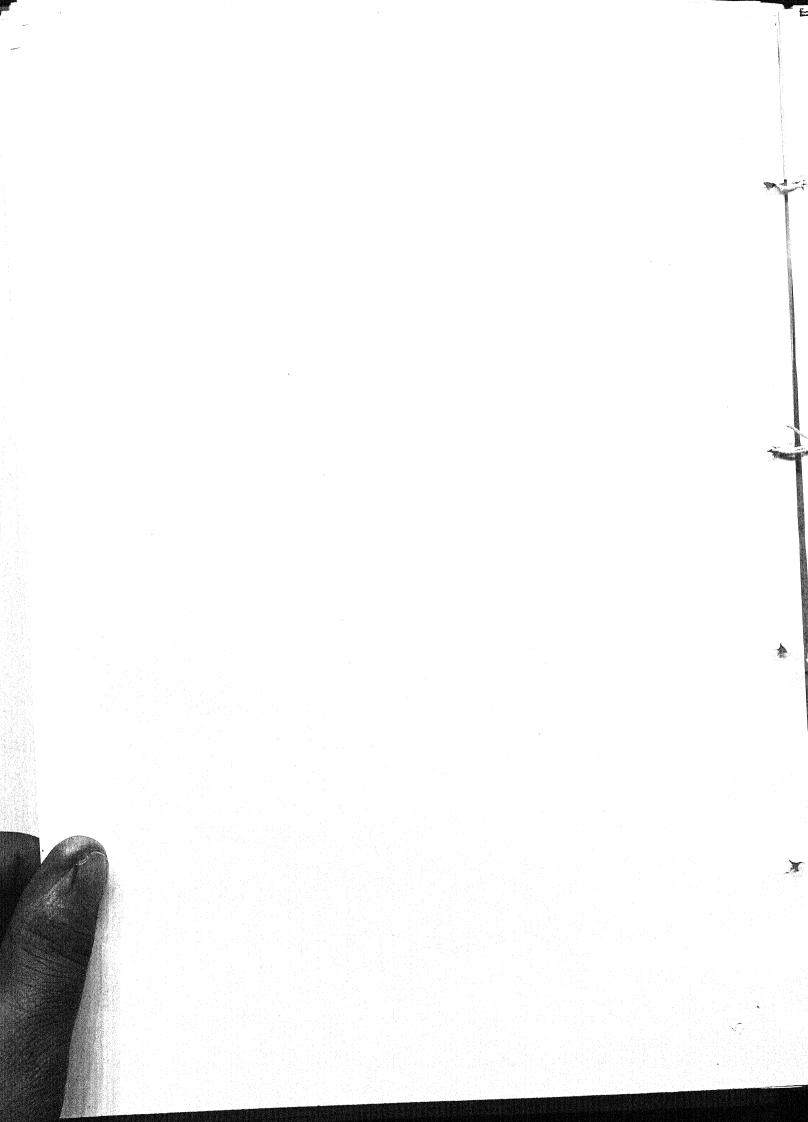
For classifying districts according to the level of development a composite index may be prepared using multi-indicator approach. As the exercises done by the Chakravarty Committee on Backward Areas show even simple device for preparing composite index like ranking method or relative index may help in identifying the hardcore backward districts.

Apart from simplicity, the chief merit of this model is that it ensures a more balanced inter-district allocation of funds in consonance with the priority accorded by the planners to the objective of development of the backward districts. Its major drawback is that it slurs over finer differences among districts within the same group. However, this problem can be minimized if one takes a larger number of groups into

The second approach which is worth considering is that recommended by the Fact Finding Committee on Regional Imbalance in Maharashtra. In addition to the State level schemes, State pool of district level schemes, and other district level schemes, the committee suggested the creation of a "State Pool for Removal of Specific Backlog" by taking out outlays meant for selected schemes from other three log" by taking out outlays meant for selected schemes from other three pools. The suggested pool was to cover 26 sub-sectors or items perpaining to socio-conomic infrastructure including road development, irrigation, rural electrification, health and education services and land development schemes. In fact, "the Pool for the Removal of Specific development schemes, In fact, "the Pool for the Bemoval of Specific Backlog" was to be the single largest component of the plan outlay (i.e., around 40 per cent).

The Committee recommended the following procedures for allocation of funds from the "State Pool for Removal of Specific Backlog":

(a) Identification of approved outlays for specific relevant



sectors/sub-sectors/schemes/programmes in the Annual Plan

(b) Reserving 15 per cent of the outlays for completion of on-going works/projects not relevant to removal of backlog and for meeting the needs of natural growth; and

(c) Allocating the balance of 85 per cent of the funds, sector by sector, to all districts with a backlog in proportion to their back-

log measured from the present State average.

any other purpose. Consequently the committee suggested slight modification in the altocation formula to cover the normal district sector schemes by taking out the weights given to backwardness in commarked for removing specific backlog and should not be diverted to It was also emphasized that these allocations must be treated as earmunication and irrigation and adding them to population.

district. The only drawback in this scheme is that it tends to restrict the freedom of the planners at the district level. However, this drawback can be minimized by suitably adjusting the share of plan funds going to providing a minimum level of socio-economic infrastructure in each Finally, it suggests a strategy of balanced regional development by meeting the requirements of inter-regional equity. It gives weight to the extent of backlog in each specific item. It also enables the State planners to ensure that the district plans adhere to national priorities. provides a clear-cut mechanism for transfer of resources to the districts the committee is worth adopting by other States on several grounds. It ing up the bottom. In our opinion the model of allocation suggested by district disparities in development through a continuing process of lift-Thus the committee suggested a novel way for reducing interthe "specific pool" and other district level schemes.

### Need of Untied Funds

gree of tocalism in planning could be built into the district planning process." In Gujarat 15 per cent of district sector outlays are earmarked to meet local aspirations and requirements. The Working Group on District Planning has endorsed this approach as in this way, "some detrict planning body for taking up some local development programmes Two other considerations relevant for disaggregation of plan funds to a provision of "free" or "untied funds" which can be utilized by the disthe district level may be mentioned at this stage. The first is of making

for such discretionary or free funds. Karnataka also has a lump sum provision for this purpose.

### Incentive Provision

der this provision. In this connection one can think of some alternative indicator like performance in family planning programme or poverty mance in the national savings programme. This is, however, creating certain distortions as more developed districts are benefiting more unreserved for this purpose to provide grants on matching basis on a graded scale according to the level of backwardness. In U.P. three per cent of the outlay is allotted to the districts on the basis of their perforresources.7 In Gujarat five per cent of district sector funds are keph of participation among people and motivate them to mobilize local the Working Group on District Planning, this would increase the sense tricts should have an incentive element built into it. As pointed out by Secondly, the mechanism of division of plan outlays among the discradication programme, etc.

#### Conclusion

gradually increase transfer of power and resources from the State to the light of the experience gained over time. There is a need to district level as the planning capacities at the district level are imideal to be achieved. The scheme has to be extended and improved in The recent efforts towards decentralization of planning to the district level are a move in the right direction, though still falling short of the

questions related to the indicators of backwardness, their relative weights and specification need a fresh look in the context of each concerned, the present formula is not producing a fully satisfactory result although it is weighted in favour of the backward districts. The As far as the question of allocation of plan funds among districts is proved.

While the details of the allocation formula may differ from State to As discussed above it is generally agreed that the allocation State, certain broad features of the formula would be common to all. mechanism should:

maintain a proper balance between the share of the State and



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- give adequate weight to backwardness,
- include an element of incentive, and 88
- provide for carmarking of certain amount as untied or free funds to be used for schemes of texal development. (<u>i</u>x)

log' is to be created. The funds under this pool are to be distributed sector by sector to all districts in proportion to their backlog measured In this connection we would strongly recommend the adoption of the scheme suggested by the Committee on Regional imbalances in Maharashtra under which a 'State Pool for Removal of Specific Backfrom the present State average.

Funds under other district sector schemes should continue to be allocated on the basis of the present formula appropriately modified. An

growth in individual districts or sudden curtailment of funds. Finally, a certain measure of stability in the plan aftecations over a given plan period would be desirable. The pattern of inter-district allocation needs The move to the new mechanism of allocation should be done in such a manner which does not disturb the present momentum in to be scrutinized at the end of each Five-Year Plan periox and modified illustrative formula is given in Appendix 6.3 for this purpose.

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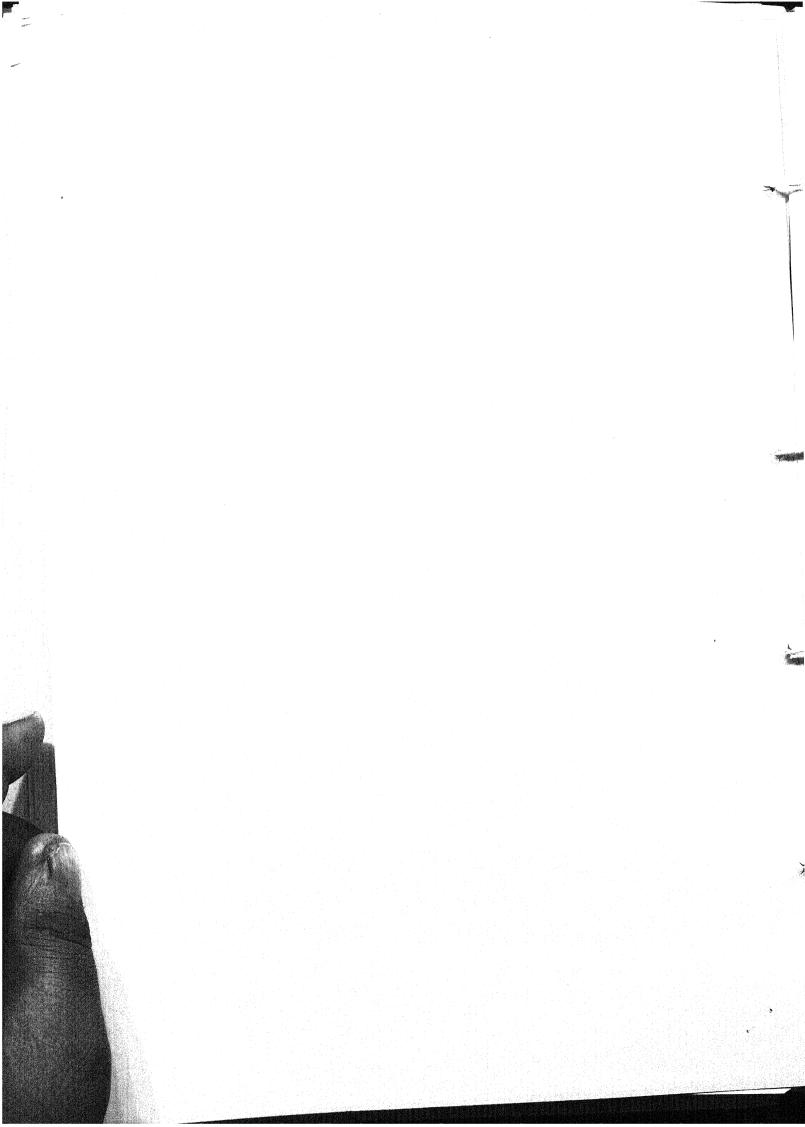
ALLOCATION OF PLAN FUNDS TO DISTRICTS IN U.P.

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YPPENDIX 6.1

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• For computing the population for the purpose of the formulate in Gujarat only niral population and population of towns with less than 50,000 people were taken into account.
Report of the Working Group on Durkiet Planning, Amerium 4.1.

Source:

**VPPENDIX 62** 

Districtwise level of Development, Per Capita Commodity Output and Per Capita District Plan Outlay in U.P.

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ALLOCATION OF PLAN FUNDS TO DISTRICTS IN U.P.

APPENDIX 6.3

(m Percentage) Weightage

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(b) Number of Small & Marginal Farmers 8.

(a) Agricultural Sector

Backwardness m.

(b) Industrial Sector Problem Areas like:

(a) Pepulation of SC & ST Agricultural Labourers

Weaker Sections

(b) Othan Population (a) Rural Pequilation

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# Decentralized Planning - A New Experiment in Relation

Ms. Ing Mathagar

Decentralization of the planning process has become, of late, a matter of world - wide concern, whether in socialist or mixed economics. Recourse to decontratized placeding is being felt essential to ensure ective participation of incal population in the development process as well as to quard against officials of over centralisation. In India, many states are larger than certain nation states like France and Cormany (one larger than even Japan) in terms of area as well as population, and therefore, even after considerable devolution of power from the Centre to the states, there would be excessive contralization much further. Though Zila Parishads (at the district level) and Panchayat Samilia (at the taluk level) have been at work in several states, as also Gram Panchayats (at the village level), the actual decentralization of political and administrative authority and the related decentralization of economic functions and responsibilities have been so far of a limited nature. It becomes necessary, then, to be clear at the very outset as to what precisely are the

Letterer in Economics, S. J. S. Govr. Lettegs, Machaeola (Raj)

functional reasons for decentralization apart from the greater scope it would provide for popular participation. Thus, viewed from the economic perspective, the case for centralized planning rests on certain objectives which can be listed here as follows:

#### Advantages of Decentralized Planning:

riest the large size of the country in which the soil, topography and other agro-climatic conditions vary so greatly within each state that any programme calls for considerable experimentation, adoptation and flexibility according to the environment in each region and sub-region. This is seldom achieved when the programmes are formulate at the State level and implemented through a multiplicity of departments functioning on the basis of directions from above (Economic Advisory Council, 1984). Thus, it is difficult for any macho level planning to cover effectively the resources of local level significance and spatially disturced economic activities pursued on small scale at homeocold and village levels.

Second, descriptable the involvement of local-level representative institutions in the fermulation of plant for development as well as their implementation is being advocated in the Interest of efficient utilization of resources and for ensuring

more equitable sharing of bonefit from development.

Third, it has been fait that the present sources of energy are inadequate and too coully in denergy to mustain broad based rural development, particularly when the requirements of higher productivity in equiculture and allied industries are taked into account as also the costs of transmission and discribition of commercial englay from convention at sources can encit as obels redroctanted power and oil. To overcome this creetal bettleman, it is warantial to evolve, according to the conditions in week area, appropriate wives of these sources of commercial energy with as horeconventional sources such as from wind, animal and plant waste and sun. The diffusion of knowledge and technique for such rural development, and building up an adequate smorey base using all available sources, require agencies working in close esociation with communities in villages and small terms and having at the same time the mecessary technical and financial support from organizations oriented to these objectives.

Fourth, bringing the peripheral groups of poor and disadvantaged within the mainstream economic processes needs programmes, personnel and organisational structures at the grassroots for identification, initial apport and guin towards vishility (Rab. V.M., 1983).

Fifth, linkages have to be built up between dispersed rural settwhements as well as between them and adjacent small rowns, through appropriately located infra-structural investments as in feeder roads, improved transport, storage and marketing facilities, and various welfare and service centres. This will give the rural people stimulus to produce for larger markets, the availability of the required inputs and the viability of the educational and health centres essential for meeting their requirements. And this is vest done taking into account the conditions in each locality, the resources that can be raised locally, and the priorities as perceived by the people concerned. Lastly, it is important to have participatory mechanisms in the planning for resources and needs with a view to promoting among the people motivation, habits of self help, local level leadership and active role in strategic and planning decisions.

Given these demanding objectives and characteristics of decentralised planning, it is only to be exepected that the progress in this area may be gradual but once it sets in, it will surely lead towards the development of the whole environment.

## Decentralised Planning in Icola

In India, the concern for decentralized planning is as old as planning itself. The first five year plan was as clear and eloquent as any latest official document

on this subject. The following lines from the first plan document bear this out: \*A democracy working for social ends has to base itself can the willing essent of the people and not the opercive power of the State

their own views about their needs and difficulties and correct solutions must be elicited and given the fullest weight in making the plans, in the execution of which they will be called upon to assist...... Means have, therefore, to be devised to bring the people into association both at the stage of formulation of the plans and in their implementation from stage to stage.

The same position was reiterated in one form or another in all the subsequent plan documents.

The Balwant Rai Mehta Committee appointed in 1957 recommended constitution of statutory elective local bodies with the necessary resources, power and authority developed on them and a decentralized administrative system working under their control which became the gevesis of the Panchayati Raj system introduced in the country. The Flanning Commission issued guidelines for district planning as farback as 1969. In 1977, the Planning Commission appointed a working group under the chairmanship of M.L. Dantwala to draw up guidelines for block level planning. Another committee on Panchayati Raj neaded by Ashok Mehta was appointed in 1977. Both the committees submitted their reports in 1978.

In 1983, the Economic Advisory Council to the Prime Minister presented its Report on Decentralization of Development Planning and Implementation in the States. The latest in the series of such reports is that of the Working Group on District Planning submitted to the Planning Commission in 1984, which formed the basis of the Seventh Plan proposals on decentralized planning (Reo CH Haumentha 1989).

The effective decentralization in planning in India exists today at the State levels vis-a-vis planning at the central level. The effectiveness of decentralization in planning at the State level seems to depend very much on the size of the state. The smaller the size of the state, the greater seems to be its ability to take decisions quickly and implement the programmes effectively by promptly reaching the grassroot lavels and responding to their felt needs. Moreover, smaller size of the State combined with structural changes as land reforms seem to have had a greater impact on growth and social justice than formal decentralization of planning below the State lavel. West Bengal, Karnataka, and Jammu and Kashmir belong to this category. In Punjab and Haryana, at the sub-state level, the effective units for decentralised decisionmaking seem to be the millions of farm and non-farm households whose intlative has been released on account of

progressive land tenures, good infrastructure, profitable technology and responsive administration. At the other extreme are big states like Uttar Pradess, Bihar, Madhya Pradesh and Hajasthan where decentralization of planning at the sul-state levels is highlighted as a felt need and one finds a visible concern among politicians and administrators for decentralised planning.

### New Experiment in Rajustban.

Inview of the above experience, one can clearly analyse the different aspects and effects of decentralised planning in Najasthan, A three -tter Panchayati Naj system exists in this state with Zila Parishads at the district level, Fanchayat Samitis at the block level and Gram Panchayats (covering 3 to 5 villages) at the village level. Dajasthan ocvernment has sought to give top priority to the development of villages in its plan structure. It has been exparienced that unless there is active participation of the poods concerned, it may be difficult to implement various developmental schemes at village level. At the same time, it may generally involvement is development process. plug the learnier and activate development functionaries. Thus development all at any its tage meaning only when the government and the local pagete work in close co-ordination with each other. At the same give it has also been realized that though the Pandayas Naja Paras

institutions have been operating for quite some time now, it has still been a far dry to involve the masses in the decision making process.

An impovedive scheme has been launched in hajeschen ils. Monis Sammarana Land' from Est Tanuary 1911 Mout 10 per control the total plan outley in the state have: been sammard for this ocneme. The sememo andeavours to actively involve the need neople in the decision making and implementation of locally designed development projects. The severagent has decided to contribute as much as 70 per cent of any aroject at the village level in the local population shares 30 per cont of the cost. Thus, each village panchayat can design as many projects as possible and obtain 70 per cont cost from the public exchaquer. It is expected that each MLA (total 200 MLAs) will keep various Panchayats in his constituency to propose projects under this scheme. Since them, many povelopment works have cropped up. As compared to Ds.20 crores allotted in 1301-22 . ha.50 crores will be spem next year. A special provision will be made for supess 10 crores extra. For this gurphow, suppes is crores will be collected by the co-eneration of the rutal local people and the remaining Suppos 25 grates will be made available by Jawaner Hozgar 701000

Solema, 'some Good and cam' in a critical manner, yet, we can be at it is given in mind the experience of similar

kind in other states and the background of decentralized planning from its initial stages in the State Itself.

participation by the local people in decision making of implementation. So far budget allocation by the government was exclusively spant by the officials and people's representatives. People at large did not feel involved or they thought they did not have any stokes. Now, with 30 percent resources being contributed by the villagers will motivate the villagers to keep track of each tupes being spent. This will bounts leakages of funds, and prodent spending will be ensured.

Exclusive dependance on the state for development processes will be changed to self-help and faith in own thitiative. Ever the last 40 years, various development programmes started by the government has generated a feeling of indiffence among the rural folk towards these programmes. Officials and non-officials working in the rural areas have confronted indifference & cold attitude if not, repulsion, for towards schemes designed/their own benefits and upliftment. However, when a competitive spirit among different Panchayats will be generated, people will try to committee as much as possible so that their own Panchayat may be given more runds for different schemes under their programmes.

of balance in resource contribution. In this scheme, contribution by each household or individual is to be determined at the Panchayat level itself, people know the economic status of each, household and contribution by each household will be determined in accordance with their paying capacity.

Pesides, it will also be possible to keep a strict quality control at the time of implementation/although villagers will contribute for a particular scheme, they will be vigilant and active during the execution of this scheme. It has been experienced during famine relief works that payments were supposedly made without any tangible work having been completed and nobody bothered. Now that 30 per cent rescurces would be generated at local level. Feople will like to ensure that money is well spent and so called corruption is eliminated. However, we must safequard against some of the pitfalls which may accide in the course of implementation of this scheme. First of all, technical know - now and expertise is not readily available at the Panchayat level. This must be provided by the technical staff available at the Panchayat Samiti level or attached to the DRDAs.

Secondly, while designing a particular scheme, it is possible that the influential segment of the village

particular facility in such a way that its benefits accrue to a particular segment of the village society. Of course, there are compted members in a village Panchayat but these members have not been able to exert any influence on the decision making process in the past. However, in the wake of new scheme 'Acra Gaen apana Kami'it becomes essential to involve all the villagers in the decision making process. This will ensure maximum benefits to the village as a whole. It may be essential to involve awareness compaigns or drive to organize the rural to achieve this avowed objective.

A judicious amalgm of officials and non-officials should be brought out to work as Friend, Philosopher & guide of the village people. Imm times to come when village people gain some maturity in respect of self-help and decision-making process, a larger proportion of State plan should be earmarked for local level planning. Instead of 10 per cent in Rajasthan, in Gujarat 20 per cent has been apportioned for this purpose. (Government of Gujarat, 1986) Gradually, the size of plan to be implemented at the local level with the involvement of local people should be raised.

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#### THE VILLAGE AS THE PLANNING UNIT IN DECENTRALIZED PLANNING

#### Y. P. Singh\*

India, by and large, has had a centralized system of planning since its inception. The macro level plans were largely prepared at and controlled by the centre. Bureaucracy has emerged powerful in this system. However, for the past few years much has been said in favour of decentralising the planning process since macro planning has not been successful in achieving the desired goals at the micro level. But without changing the whole system of the government as well as the system of planning, it is very difficult to move towards the goal of real democratic decentralised planning.

At present, in the planning system, policy makers have shown a distinct tendency to promote the interests of multinationals and big industrialists. The big business houses give large donations to political parties and are able to purchase powerful representatives in the parliament and the government. The outcome of this procedure is that economic policies mainly serve the interests of a selected few. Economic growth remains restricted to a few urban centres and the rural areas, where bulk of the country's population resides, remain by and large neglected.

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Democratic decentralisation is an attempt to check the evils of the centralised system of planning. Still the debates are going on about the decentralised system of planning in India. If we look at our achievements on the basis of various developmental indicators it clearly shows that over the years the country has definitely made considerable progress on various fronts and this does give us a sense of satisfaction. But this does not mean that the situation is optimal since, on the other hand, India continues to have a very high percentage of illiterates and unemployed and poverty continues to be a major malady.

Prior to the British Raj the Indian villages were virtually self-sufficient and Panchayats enjoyed their rights. The development of the villages was dependent on local resources and villages had their own local government. The self-sufficient nature of the villages was changed by the Agriculture and handicrafts British. were adversely effected. Private ownership of land cause into force and Royal Commission on several land laws were decreed. Decentralisation was appointed in 1907-08. The Commission recommended that Village Panchayat should have judicial powers and the number of members in each Panchayat should be atleast five. Local self-government was subsequently introduced in 1918.

After Independence, Five Year Plans were prepared for socio-economic development of the country. Community

development programme was introduced for the rural masses. Panchayats were envisaged to a vital role in rural areas. Balwant Jai Mehta Committee which was constituted to study the problems of community development recommended a three tier Panchayati Raj system. Panchayati Raj bodies vis., the Zila Parishad at the district level, the Kshetra Samiti at the block level and the Panchayats at the village level were created with the twin objectives of (a) the decentralisation of specified powers and functions of the state to these bodies, and (b) the democratisation of the administrative structure at local level so that the people could have an effective say in the planned development of an area. 1

We shall now briefly touch upon decentralised planning process under the Five Year Plans. In the First and Second Five Year Plans, community development programme was the main programme of rural upliftment. During the Third Five Year Plan, Panchayati Raj institutions were set up in various states with great enthusiasm so that the local resources could be used for development with the cooperation of rural people. During the Fourth Five Year Plan emphasis was given on more active involvement of Panchayati Raj institutions in area development. The idea of grass roots or village level planning came up, though some people were of the view that the district should be the lowest unit of planning, while the block could be subsequently made a unit of planning for

Commission on District Level Administration, Vol.1, Government of U.P., August 1986, p.42

development. The Planning Commission issued guidelines to prepare district plans in 1969. These guidelines were the practical approach towards 'Decentralised Planning'.

Since 1970's several poverty alleviation and employment generation programmes were launched in rural areas. To implement these programmes a strong base of planning is requested at the village level. Valuable contribution in this direction was made by the (Working Group on Block Level Planning 1978), Committee on Panchayati Raj Institutions (1978) and the Working Group on District Planning (1984).

The Working Group on Block Level Planning emphasised formulation of Block Level Plans. It was also felt that at all levels people's participation is very much required. The Committee on Panchayati Raj Institutions. however, recommended that below the state the lowest unit of planning mav be the district. The Committee rejected the idea of planning at Block and Village levels. It further recommended that a cluster of villages called Mandal Panchayat be used for planning purpose below the district. The Working Group on District Planning, on the other hand, emphasised that district planning should be strengthened and all resources should be put under the control of the district planning committee.

After 1969, with the development in the planning process as well as in the methodology of local level planning, the concept of decentralized district planning has gained ground.

Maharashtra followed by Gujarat and Karnataka took the lead in this respect and Uttar Pradesh followed suit. Uttar Pradesh Government took the decision in 1981 to start the process of decentralised district planning. 2

District is now used as a district unit of planning below state level. The various sectors to be covered by district plans have been demarcated and a formula to allocate funds was evolved. For proper implementation of developmental programmes, two committees have been set up at the district level.

The issue of decentralisation of planning activities at the district level has thus been engaging the attention of the government at the centre and state for some time. The Seventh Five Year Plan emphasised the need for decentralised planning in order that available resources both physical and financial could be used to optimise the economic development at the district level. 3

The Draft, Approach to the Eighth Five Year Plan, envisages effective decentralisation of the Planning process. It involves not only a reorientation of the focus and the priorities of planning, but also processes and mechanisms. The process will be enriched and made more effective by the

<sup>2. &</sup>lt;u>Draft Annual Plan, 1989-90</u>, Vol.IV, Uttar Pradesh, p.1

Devendra Thakur, <u>District Planning and Panchayati Raj</u>, p.161

involvement of the people in planning and its implementation through democratic decentralisation a through closer association of the Planning Commission with the State Planning Organisation. The state planning agencies will need to interact closely with institutions of democratic decentralisation in the rural and urban areas.

Over the years, a four tier multi level planning system emerged in our country, namely, (a) national level, (b) level, (c) block level. Of these, the first tier viewed planning from above while the last one viewed planning below. The state and the district planning processes provide the link between the two. The last kind o f tier, block level planning is still not operational in most By and large, planning still continues to be centralized were most of the inputs for planning came coming from above. The efforts to broad base the process of planning were weak and half-hearted and have not, therefore, met with any significant success.4

Presently the unit of planning selected below the state level is the district. Once this process of planning is strengthened it may be further decentralized to the block level. Two committees at the district level viz., District Planning and Monitoring Committee and District Plan Coordination and Action Committee, have been constituted in

<sup>4. &</sup>lt;u>Draft Eight Five Year Flan (1990-95)</u> and <u>Annual Plan 1991-92</u>, Vol.I, Uttar Pradesh, Planning Department, November 1990, p. 148

each district of U.P. People's representatives are also members in these committees.

It is felt that there is no significant micro-planning at any level. It is still macro-planning through and through based on macro aggregates and the wisdom perceptions, experience and expertise of those operating at the centre or at the state. There is no worthwhile participation of the people directly or through their representatives in planning process. These inadequacies symbolize the present centralized and bureaucratised planning.

prof. V.K.R.V. Rao advocated that the unit area for planning should not be a village but a group of villages or a cluster of villages as the present villages are not viable planning units.

However, we wish to emphasise again that village, must be adopted as the unit of planning. This concept may not be discarded on the ground that it will not be viable. If we go in for a cluster of villages there is every danger that the bigger villages with its more influencial persons will be able to corner maximum advantage at the cost of the smaller villages. Thus planning should be carried out from village upwards keeping in view of the overall national interest. Each village will be free to chalk out its own programme and accordingly estimate its financial requirements. These financial resources would then be disbursed from the higher

<sup>5.</sup> Draft Eighth Five Year Plan, Vol.I, Uttar Pradesh, p. 160

body to the state and the district levels. It is quite likely that enough resources may not be available to meet the total requirements of each village. Once size of funds is known the villagers can then sit down and decide which development schemes are to get top priority.

The ancient vilage in India was a self sufficient and self governing community. We must be bold enough to say that villages are exploited today, though in the name of development several schemes have been launched for the upliftment of the villages.

The concepts of community development and Panchayati Raj have also been introduced at the village level. The Panchayati Raj System provides the structure of a decentralised system of government as well as planning. Gram Panchayat has an old base in the rural masses. But Panchayats have not been made financially strong in spite of its reponsibilities for rural development.

We have to develop the idea of the village as a self sufficient unit. Block and district units have newly emerged but 'village' is an old functional unit. The village had panchayat in ancient India and these looked after the village community. The people of villages were capable of administering their own local affairs.

Presently district is the key stone of the development.

People's participation is only on paper. Since ever where

people are placed in various committees, it is the bureaucrat who take the vital decisions in the actual planning process without the active participation of these nominated members.

Land and all other resources of the village are to be managed and developed in the interest of the entire village community. Panchayats may plan for village development with the cooperation of voluntary workers or institutions, teachers, etc. If we deeply analyse in the present context, village has a key role to play in our democracy. Village is the basic unit, blocks, district, state and the nation are all formed with the grouping together of the villages. It may therefore be worthwhile to change the entire structure and create conditions to plan at the lowest level, i.e. 'village'.

We have to move from below to top in the planning process if we really want to do justice to the village community, which has been serving the nation tirelessly from times immemorial. It is certainly a difficult process because our bureaucrats will not easily allow the sharing of power. This is evident from the fact that in the present decentralised planning they have not loosened their hold on their administrative power. People's participation at the committee level has been introduced but it is more of a formality.

Thus, the village should be the unit of planning and the family the working unit. A village unit can be well

organised on the basis of self-sufficiency. If genuine efforts are made and the active participation of the people is ensured the development of the villages can become a reality. The village folk can be expected to muster their own resources and with additional financial help can certainly achieve the all round development of their respective villages.

The village itself can be the planning unit and agriculture, village industries, education, sanitation, health, etc. can be managed and planned by the people themselves. Every one, including poor needs to participate in the planning process. Without their popular participation it is very difficult to move towards real decentralised planning.

Presently it is only a slogan that one hears all the time that planning should be at the grass root level. But the system of working remains centralized in the hands of the government officials. We much talk of 'planning from below', but no one bothers for the developmental work of villages, except during election time.

Decentralisation and peoples' participation at all levels are the needs of today. If this is not done the goals of a welfare state, poverty eradication, improvement in the quality of life, income and employment generation, etc. will remain unfulfilled dreams.

Planning must begin at the bottom. Thus every village will be free to make their plans in view of the local resources. Every village has to become a self-sustained economy. Today we require village level planning. Villagers should exercise their own minds to prepare 'village plan' according to their need. When power will be in the hands of every village then alone we can bring about actual decentralisation of power. Popular participation is the crux of a decentralised democracy.



entitled to a security of the security of the

The paper line at providing a discretical synthesis belong the objective or nutti-level planning in a decentralised framework. It gives a brief introduction to nutti-objective propleming and multi-level planning and highlights the co-codination problem of a combined multi-objective multi-level planning treategies for a system divided into a set of subsystems require methods of resoletion or goal conflict or interest conflict energing from the interestion among the components of the system. Hence a decentralised system of decision making should guarantee an allocation of resources which must ensure a meaningful components among various policies of different spatial segments.

In informations and data on the following three aspects, inter alia, are ascential in order to analyse the interaction among the spatial compenents of the decembralised system and the complexity involved in the decembralised policy or decision-making levels.

of intersection and interdependence subsisting among various components of the system.

(iii) Educios-conflict: It refers to the conflict that exists along various interests and strategies that are adopted y some at competing decision units. It may be termed as inter-component (inter-regional) conflict.

The linkage mattern and interceptance are better represented and explained by structural models, which describes all interactions within and between the components of the system. For example an inter-regional input-output model describes the functional comming relationships within and among the regions of a national economy.

Interior conflict is properly resolved by the use of a multi-objective programming in which a vactor optimization problem represents the conflict existing among a set of multi-dimensional objectives. For example a multi-dimensional programming resolves the friction between the maximum production of industrial goods and a maximum of environmental quality within the given spatial component. Hence a multi-objective programming aims at dealing with multi-dimensional nature of choices and conflictual options of a given region.

described by the use of a multi-level program in , which ensures a co-ordinating

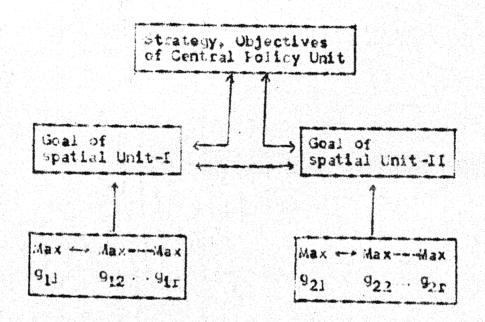
mechanish such that a meaningful balance among the conflicts of various policy level of various components can be maintained. For example a multi-level planning resolves the problem of allocation of investible funds by the central Government in coder to stimulate regional industrial growth.

either as a to, -iown centralisation policy or a botton-up decentralisation policy between uliferent decision levels in urder to eliminate the sub-optimal or less efficient social choices.

12 THE MOSEL

The figure-i depicts an iblustrative representation of such a multi-objective and multi-level policy in a decentralized framework.

Fig. 1 MULTI-DIMENSIONAL DECENTRALISED MEDEL



It reflects the multi-goal and multi-level conflict \*\* profile. It illustrates the interaction among various spatial components of the relevant policy strategy. The various goal functions are denoted as  $\mathbf{g}_1$  ,  $\mathbf{g}_2$  ---  $\mathbf{g}_r$  (of a given spatial unit). The model clearly represents a double-choice conflict viz butween intra component goals and inter component interest. The goal conflict emerges from the diverging nature of objective and priorities within a given spatial unit in the face of rescurce constraints. This kind of problem involving conflictual choice are dealt in the field of muiti-objective programming. But the conflict among the spatial units emerge from:

- linkage or spillover effects abong various spatial components, for example imput-output linkage of a multiregional system on spatial negative externality etc., are the source of exterior conflict.
- (ii) Competition or rivalry to secure large portion of the scarce resources by the policy units, Spatial components do fight and continuously complain for larger percentage of resources wotch obviousi/ reduces the share of other regions.

Let us conceive of a decentralised system where the policy unit has two regional components. Let they be denoted as x and y. The intra-regional and inter-regional structure of the first region can be represented by means of the following

 $A_{\mathbf{x}} = f(a_{\mathbf{x}}, a_{\mathbf{y}}, s_{\mathbf{x}})$ 

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Where I a denotes a set of relevant variables for region x lake volume or employment pectors: I vals of production, emission of action ion, when or fuel and energy subsomption level etc. is, denoted the vertor of the corresponding variables for the accordance variables for the accordance to the corresponding variables for the accordance to the corresponding variables for the accordance to the corresponding to the correspondin

Analogous / one our derestie and the foreston for region y:

where: 'ay' refers to the set of relevent variables for region y, 'ay' represents the vector of corresponding variables for region A and sy is the vector of exogeneous variables for region y.

output, linkage, transport flows, migration flows, commuting pattern and environmental externalities are several examples of inter-regional interaction, Such interdependence among the regions (or decentralised unit) can be illustrated by the following matrix:

6ig. 2

# IN BUT A GLONAL INTERNOTION

	degion '	Region
i jin x	axex	a, a,
decton a	3,3x	54.4

to the Figure-2, the diagonal cells of the matrix represent intra-regional interaction (including goal-conflicts) while off-diagonal cells represent inter-regional interdepsndence (including interest-conflict).

interactions are normally constrained by a set of conditions, which identifies the action space of the decision units. These constraints may be technological, eponomic, environmental or institutional. So the feasible zone of a may be represented ensembly my such that

Analogously the feasible zone of  $\mathbf{e}_{\mathbf{y}}$  may be denoted by  $\mathbf{n}_{\mathbf{y}}$  such that  $\mathbf{e}_{\mathbf{y}} \in \mathbf{n}_{\mathbf{y}}$ 

with the existence of such a constrainted situation one can specify the following type of multi-regional and multi-objective programming in a decentralized framework.

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A whole a multi-objective matrix can be obtained.

Fig. 9 INTERNATED PULICY FRANKOK

	Region	Ragton y	Total system
Objective ( functions			
		ter and the state of the state	The second secon
		A STATE OF THE STA	

in this figure-3 each column represents cartain intra-regional profile of all relevant objectives, whereas each row represents the inter-regional profile of a given objective function. Thus the horizontal optimisation yields the maximum value of corresponding objective functions while the vertical optimisation yields a maximum value of all objective functions within one region. Obviously both directions involve serious policy contradictions between components and objectives. Therefore, an appropriate comprehense framework has to be devised which leads to a satisfactory

Fuerency December the commons and objectives.

The gaps between the goals of decentralisation and the results of policy implementation in the developing world remain verymech wide. In several cases, reverse, relatively successful decentralisation has taken place, which implies that there do exist factors and conditions in those countries which are conductive to the achievement of decentralisation objectives. So the implementation strategy for decentralisation should attempt to maximise the impact of support factors while at the same time minimising the constraints. It is contended that the reality of the situation in developing countries is such that an incremental implementation strategy clearly articulated and continuously implemented in stages over a long period of time would be politically feasible and would lead to meaningful results.

After a feasible scope of decentralisation is determine policies must be translated into programmes and organisational arrangments must be designed for transferring planning and menagement functions, againedly decentralization can be very successful if the process is incremental and itacative. Those a special or programms that are least likely to be opposed and for wolch there is administrative caracity should be expanded, a tra clibboal support and administrative competence increased there's the mass modes, training and public internation programmes and political pargelaing must be used so logge a base of support for decentralisation policies. Ecucthly means must be found out of reoccenting central administrators perception of their roles from control and direction to support and facilitation, Lastly the implementation of decentralisation policies must be seen as a continuing process of modifying government structure and procedures as conditions basone more conductive to incremental expansions in their scope and application. The ability to adjust and adapt depends on effective menitoring and evaluation process that gauge the pace and impact of decentralisation and from which information can be derived to make policy changes in more appro rists direction.

Ultimately decentralisation can be effective only when agencies and actors at the regional and local levels have developed the capacities to perform effectively the planning, decision-making and management functions that are formally

granted to them. Their effectiveness as participants in a decembralised system depends on the ability of local organisation to:

- (1) Identify development prospects and opportunites.
- (Lt) create point ble sclusion to development problems.
- (ull) make and sions and resolve conflicts.
- (IV) (Dolling resources.
- (v) menage do resonment programmes and projects.

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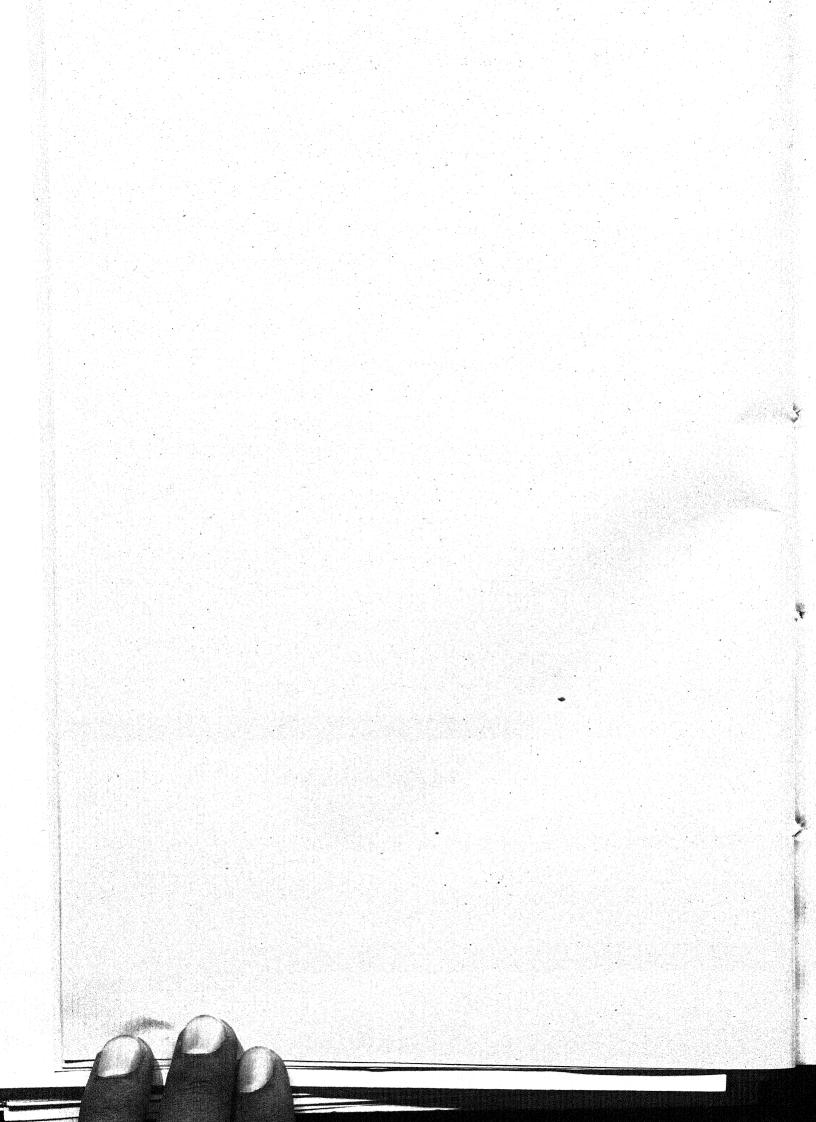
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Jayshree Shab

Sardar Patol Institute of Economic and Social Research, Almedabad.



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vecentralised Elaminis A Conceptual Franceork:

defined as planning from and for any stage either it may be state, district, block community or viriage, which is below to the Control Hounts; Unit.

The major reason is or a pultonophy that amaiter units can better be managed (small to beautiful visdom) they may be either production units or planning units. The geographically distance and diversity in natural resources, cultural differences and variations in the level of development may differ across various space of a nation. To map out those diversities and to collect information about the resources, people etc. for their optimal use needs a dispersed information compiling network which is the basic ingredient of planning. Hence the dispersed information network is the first step in the process of describination. For this, it requires to share the ownership of resources, power etc. and it has to not up decision making units below the central planning units.

Now in this process of decentralisation some complexities may arise. If for example the process for

<sup>1/</sup> dea Raymond Apthorpe and Diana Convoyers, December Fortion, december the Limitage for and reputar Participation in Developing the Countries: Towards a Francisch for Analysis, Development Aptimise, Volume 1, Automo 1962.

complementary to the central planning. The former may result if the decentralisation is treated as an imperative due to the unmanagable size of the space rather than as a need resulting from the strong political will and a voluntary and self motivated value system to share power and autonomy and ownership of resources to increase people's participation in the development process. The decentralisation planning process desirably may result into complementary to the central planning unit if the process is started with an accepted and expected spirit rather than due to the sheer compulsion of managing the smaller units.

an important role in initiating the spirit of decentralisation. The capitalist nations are believed to have
generally a slow and balf-hearted initiative for decentralisation planning process because—the means of production
are under the private control. In these countries the
usofulness of the decentralised information network is the
prime cause to initiate the process while in the socialist
countries where the means of production have social expensivity,
the decentralization planning process complements to the
control planning and a continuous of the planning process
from the control unit to the decentralised space and who see
versa taken plann. The political will and a dedicative

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attitude to share power and prosperity with all inhabitants of the country lowever are the two most important factors to make the decentralised planning process successful or complementary irrespective of the political ideology of a country. The second set of complexities may arise in the process of decentralises, planning because of the historical background of the nation which may leave behind it a structural order or discreter in the society. It results into the varieties in the cultural othes and rigidities in the adoptations for any change (generally of positive direction). If the nation has undergone in the past the experience to be ruled by the rulers from different cultures and had /experience as an under previleged and exploited class of projite by those rulers it creates a asychological insocurity in the various strata of the society which causes the found social structure and power grabbing attitude. In this process class conflicts arise and the exploitative attitude continuous now by their own people who are mighty and powerful relative to others. The economic outcome of this is an income inequality, poverly, unganloyment and other consequences are political and social wirest. Contrary to this, if the history of nation is not so and enough to destroy and disturb the social and class structure it teaves behind a condusive background of political and rockal harmony which is a good lagrationt. for the healthy process of decentralised planning.

The rationale for the process of decentralised planning thus depends on the historical background, folitical set up, economic philosophy, size of the space and structure of the society. Each of these has its own importance in the process of decen ralised planning. To analyse the decentralised planning process with reference to its dichotomous or complementary relationship with central planning unit requires a very detailed information of some qualitative variables which are hard to get-However, in the following pages attempts have been made to understand bow serious the process of decentralised planning has been taken at the country level and also at the state level with special reference to Gujarat experience in this direction to draw some tentative conclusion about the decentralisation planning and its relationship with central planning unit. The historical background for the decentralised planning in India and the status of decentralised planning in the Five Year Plans have been discussed in the next two sections followed by the concept and experience of Gujarat in decentralised planning. The progress in the efforts for decentralised planning in Gujarat have been reviewed in the last section.

#### II.a

The Indian Experience of Decentralised Planning: India is a wast sized country in terms of population and certainly not shall in terms of geographical area. The Indian history

has witnessed a variety of rulers from different cultures. lowever, the colonial rule is considered to be the main cause for creating the economic inequality and exploitetive class structure in the different parts of the country. The lopsided recommic development was the another cause of worry at the time of independence. The genuine and geneous leadership however, realised the economic and social consequences of this unequal spatial development. The need to develop the neglected and exploited rural economy was firstly realised by those leaders and decentralised planning process thus was understood as a complementary to the centralised planning at the incention of planning in the country. In the context of mixed economy and in the context of desceratic set up lowever, the descritralised planning process in India has experienced all the complexities mentioned earlier and with all serious and ingenuin efforts the decentralised planning has been viewed as diachotomous to the central planning and has been subject to doubt for its success. The general consensus from the available studies on decentralised planning in India is that the process of decentralised planning in Indian case for a variety of reasons, has been slow and faulty and all efforts made since the inception of planning have hardly been resulted into reduction in inequality and has not succeeded in bringing about the growth with justice for which it was almed at. 2/

<sup>2/</sup> See 5. Chatrabarty, The Floring Process in India: An Appraisal and a Framework.

Also see D. L. Danbenia, dationale and similarious of Decembralised Planning, indian Journal of Arricultural Deponders, Vol. 38, 19.2, April-June 1983.

What efforts for the decentralised planning have been made during the Five Year Plan is reviewed in Section II.b below.

II.t

### Decentralised Planning in Indian Flans

right from the inception of planning in India. The First
Five Year Flan was eloquent in the following words "A democracy
working for social ends has to base itself on the willing
assent of the people and not the coercive power of the state,
their own views about their needs and difficulties and the
correct solutions must be elicited and given the fullest
weight in making the plans, in the execution of which they
will be called upon to assist... Heans have therefore to be
devised to bring the people into association both at the
stage of formulation of the plans and their implementation
from stage to stage.

The Second Five Year Flan discussed in detail the concept of a local horizontal plan. In the Third Five Year Plan a methodology for preparing state plan for rural development on the basis of the district and Block plan, was evolved. Also during the Third Plan period attempts were made to develop the three tier Fanchayat Rej System based on the Caluant dai Heata Committee recommendations and with it the the idea of "planning from below" gathered momentum.

Cat. CA.

int this idea did not operationalised as the ranchayati maj Institutions (PRIs) stagnated and declined after the initial enthusism in most of the states. The need for strengthening the planning machinery at various levels was realised during the Fourth Plan. The Planning Commission took initiatives in this and Planning Machinery at the state level was launched by the Commission in 1972.

Also the guidelines for District Planning were issued by the same body in 1969.

programmes for rural areas with the timust on the provision of basic minimum needs, apployment opportunities and the tousehold oriented beneficiary programmes were introduced, the need for decentralised plaining ciforts has been increasingly recognised.

The Sixth Five Year Plan appears to be the most serious in conceptualising, evolving methodology and even in operationalising decentralised planning in the country. For the lauded objectives such as the removal of unemployment, raising the standard of living of the masses, the block level planning was conceived to complement effort through fuller utilisation of local resources for full employment on the one hand and a quick attention to the local problems on the other. Two important group/commission were appointed by the Planning Commission. One was the working group under the Chainmanship of Prof.

Dantwala in 1977 to draw up the guidelines to block level planning and the second was the Committee on Panchayat ie j headed by shri Aslok Mehta to analyse the strength and weaknesses of PRI. Both these committees submitted their reports in 1978. In 1983 the Economic Advisory Council to the Frime Minister presented its report on Decentralisation of Development Planning and Implementation in the states. The latest in the series of such reports is that of the working group on District Planning in 1984 which formed the basis of the Seventh Plan projosals on decentralised planning. The working group is assigned the task of discussing the details of the changes which are necessary to be brought about in order to make the decentralised district planning effective. It has been realised now that much has been talked about the district and block Level planning in the previous plans, very little lowever, has actually been done. What has happened is only certain deconcentration of administration from state to the district Levels with the planning and decision making functions mostly confined to the higher tiers of administration and with the local population only marginally if at all associated with the activities that concern their development and welfare institutions like District Development Bards or Councils/have been constituted in many states. But they are functioning with Little or no autonomy in Local decision making. The position bowever, varies from state to state. It has ben realised by now that if decentralised planning

have to be made broad based with the active involvement of local representatives and smuld be endowed with a greater degree of autonomy in local decision making. Simultaneously several administrative and financial delegation as well an other measures have to be systematically worked out. Above all, the planning methodology for local level planning has to be firmed up and planning capabilities at the local level strengthened.

The working group of 1,84 appointed by the Flanking Commission has been assigned to discuss in detail all the above changes that have to be brought about in order to make decentralised district level planking offective.

importance of the decentralised planning in the following words him of the deficiencies of the existing programmes can be corrected by transferring a substantial part of the responsibility for planning and implementation of economic and social development programmes (mimor, irrigation, woll and moisture conservation, local flood controlling works primary education, health drinking water and inuting) to elected representative of the local government. The necessary financial resources and staff should be brought under their jurisdiction. Each village or block paintant and district level institution will then have direct command over a sizeble volume of finance and the transfer and flexibility to decide low best it can be used for incal development. This would release rural development programmes

from the stronghold of standardised "schematic" projects conceived centrally an well as from the waste and duplication inherent in the present highly fragmented scheme-wise approach. The local eres plans at the village or function and income in various economic activities ... The focus would be on ensuing socially gainful work rather than relief work, which ed-hoc esployment programmes often degenerate into."

decentralized planning in the Commission of the distinct decentralized planning in the Commission of the distinct Flans, suggests that the process has been viewed as a machemism torough which his development in the resolution areas can be reduced, and a healthy explanate and model terms can be reduced, and a healthy continues between the central planning units and decentralized planning outs and election counts very well as revealed from the specified objectives and philosophy for decembralised planning in all Five Year Plans. In realist bowever, this philosophy has not been resulted into astion even after our long experience in planning. This is an agreed view of all who are concerned with decembralised planning in the country.

The decembralised clausing bower, has been rested upon at the District Level Plauning whits in our efforts to accontraine the plauning process. Atthough which

<sup>3/</sup> Coverement of India, Planning Committation, Amptends to the Sighth Five Year Pian, 1990-95, Nepting of the Actional Davelopment Council, May 1990, Pages 14-15.

plan, the district has been treated as an autonomous (to some extent) sub-state level decision-making administrative units. Inform we evaluate or assess the efforts of decentralised planning in Oujarat. Let us be clear what is the concept of decentralised planning which has been adopted in the country.

#### III

## Connect of Permittaliand Flaunding

The working group on decentralised planning (1984) set up by Planning Chemission views it as District Planning in our view is a kind of area-based sub-state planning and arises from the need to supplement the national and state plans with a more detailed examination of the resources, problems and potentials of local areas (i.e. districts), so that investment programmes were specifically tuilored to the particular needs of each district could be evolved and implemented. In other wards district planning implies evolving a development accurring at the district level consistant with the specific needs of the people, the growth potentials of the area and budgetary allocations available. Thus the example of district planning adopted by the logating Group (1984) is an to this cancept of integrated area planning. It appears that the district is a survente

decision making unit within the system of multi-level planning. In contrast to the national end state plans, the district plan would represent a distinct multisectoral package area specific investment proposals and institutional arrangements suited in this context. "In our concept of district violating, the district is seen as a sub-system of multi-level planning. The totality of all planning notivities at the level of this sub-system would view with a single district claiming body, we would determine the priorities and alineate funds accordingly among the various development sectors. Thus in this concert, the planuling function will not be fragmented aroug numerous departments and agencies. The some of the planatag autivitian time would fall within tide subareter has of course to be decided in the first instance. It is also reorgalized that this sub-system is not parfectly closed one but recognines the openness of the Historiat economy. Thus the planning activities enmarked for this subsystem will recognise their linkages beyond it and in fact they would flow into the cain system and would got integrated Anto It."

district level planning muchinery of ther in the form of district level planning muchinery of district planning bound/ council has been set up and a process is being evolved to make the description planning successful through these been doing to the description.

# Decentralized Planning at the State Level

In the federal system of India, the history, size and socioaconomic composition of the society in different states differ. These
three variables however, affect the process of decentralisation either
in a helping or in a hindering manner. In the planning phylosophy
decentralised planning has been avoved objective and as a starting
process the powers for designing and implementing the decentralisation
have been down buted to the states. It appears that the numble
empower states for the success of decentralised planning at the
initial phase of planning process was imperative due to the vastness
and unequal accio-comemic development across states. The process of
setting up the decentralised information network both bureaucratic
as well as desicratic was started by most of the states with a great
enthusiasm and was min, viscuited as complementary to the central
planning process.

Very few studies however, are available to verify these intended efforts towards the implementation of decentralised planning across the states over a period of time. However the common observations could be jathered from those studies are:

(1) The states have different political and administrative set up for decentralised planning. Jone of the states have three tier pancheyet has syntem while others have only two tiers.\*
They also differ in the extent and neeps of the functions of

by See C.H. Handancithe Rog. December 1994 Planning - An Grotviev of Experience and Prospects, Bondonic will believe Mackle, Yol. 24, No. C. Pauruary 25, 1988, pp. 411-110.

Jean Marine, observing the Tools for Fulthlevel Flancing A Tesli Study. Fondy Lagers in Social Sciences for 1. Francis Institute, Fondichery, Fay, 1987.

tudire Mirror, Pancharati Maj at Greatmeds, Amprophe And 1911theat Works, Vol. 2014, No. 2, July, 1919, pretribe 1967.

About 14 States and union ferciberies have three lies for the exchem. A have two tier in grabes, 9 have only one tier in dystes.

district level planning unit.

- structure have been found to be important variables in smoothing or inhibiting the process of decentralisation in the states. Junjab and Haryane have been cited as examples where without any formal and settenatic set up for decentralised planning have been successful in reducing the rural poverty and raising the employment level. Besides some favourable economic factors like the increasing demand for agricultural labour and higher level of rural infrastructure, the smaller size of the states and the absence of dominant class in their resul society have been considered to have helped in raising the peoples' participation in the developmental planning in those states.
- (iii) Uttar Pradesh, M.P. and Bihar on the other hand are the states which are relatively larger in size and also have the dominating land lord class in the rural areas. Their efforts in the decentratised planning are considered to be far from successful desidte having a very formal official set up for the decentralised planning in those states. West Bengal and Kamataka are the other two states where land reforms have been viewed successfully implemented hence they have been cited as successful, states in implementing the decentralised planning. Gujarat and liaharashtra are considered to be the initiators in the process of decentralised planning. In both these states bowever.

neither the size nor the socio-economic structure have been mentioned as the inhibiting factors. Also these states are ranked as relatively developed states yet they have not been ranked as the states with successful implementation of decentralised planning. Why this has happened in Gujarat? What are the problems and prospects of the decentralised planning in Gujarat are some of the questions which need to be addressed while analysing the performance of decentralisation planning in Gujarat.

7.0

### Decentralised Planning in Gujarat

The process for decentralised planning in Gujarat is as old as the history of the state itself. However, the nature, framework and extent have been changing time to time. Before it got a status of a separate state the efforts for decentralisation were initiated in ibmbay and Saurashtre. With the launching of the community development programme, multi-desciplinary teams were formed at the block level and attempts to formulate working plans at the block level were made.

A brief history of the state in its efforts toward decentralisation may be useful to understand the problems and prospects of the decentralised planning in the state.

After its formation as a separate state, some concrete
steps for decentralisation were initiated. On the basis
of the Balvant Bai Hehta Committee's recommendations
three tier Panchayati Raj system was introduced which
was made effective from 1-4-1963. The Gujarat Panchayat
Act 1961 provides for a gram or magar Panchayat at village
level, a Taluka Panchayat at Taluka level and a Jilla
Panchayat at the district level. The district panchayat
has the authority over the entire district. The Gujarat
Panchayat Act also provides specifically for transfer of
powers and devolution of funds to Fanchayat.

According to the scheme of transfer of functions to Panchayat there are two categories of transfer of functions

to certain plan as well as non-plan programmes/schemes and
(ii) transfer of functions on agency basis. In the first
category schemes like roads, maintainence of primary health
centres, veterinary dispenseries, primary schools are
covered. In the second category of transfer of functions
the family welfare programmes execution of relief works in
case of draught or scarcity conditions, seed multiplication
programmes, are given to panchayats on agency basis. In
case of outright transfer of functions the Panchayats con
plan, sanction and implement the schemes and in case of
transfer of function on agency basis they can do the same

<sup>5/</sup> Covernment of Gujarat, Planning Division, General Administrative Department, <u>Decentralised Planning in Oujarat</u>, Sachivalaya, Gandhinagar, February 1990.

subject to certain conditions. Panchayats are also expected to participate in the formulation of Annual and Five Year Plan for the areas under the respective Panchayat's jurisdiction.

The Panchayat Raj system thus in Gujarat as an introduction to the decentralised planning works since last 24 years. It is considered to be well established for providing a firm foundation for building up and strengthening the process for decentralised planning.

The second phase of progress in the efforts of Gujarat state in decentralised planning started since 1973. The Government of Gujarat set up District Planning Boards (hitherto DPBs) to accelerate and to make decentralised planning more effective. Since then the DPBs co-exist with Penchayat Raj Institutions (hitherto PRIs) in the state.

The DPBs were charged with the responsibility of formulating district level plans for the considerations of the sectoral departments. The need for DPBs was felt because comprehensive integrated planning at district level was called for. The DPBs were also intended to provide a forum for voluntary agencies, co-operative banks and for all sections of organisations engaged in development work including Panchayats to pool their efforts on a co-ordinated basis.

With the bonafide intention to strengthen the decentralised planning in the state, the status of Disa

During the Fourth and Fifth Five Year Plans was enhanced. the DP3s were asked to formulate proposals for district level schemes within a specified cailing of outlay. For the Sixth Plan district level schemes were invited from with the district Fanchayats and also from District Planning Board so that they can be integrated in the state's plan. An official review of the performences of these two unto the Sixth Plan sets of body/however suggests that these efforts have been proved ineffective as neither the district Panchayats nor the DPHs showed any impact of their efforts in increasing the local participation. It is felt that the experiments til for an effective decentralised planning by the Sixth Plan Z through DPBs and through Pills were disappointing.

Against this background the Government of Gujarat took a noval step and from 14th Rovember, 1980 the DPBs were empowered with some financial powers. This may be considered as the third phase of the efforts towards the process of decentralised planning in the state. According to the new scheme the DPBs are enjowered to select, formulate and get implemented the schemes of the local importance. For this, 20% of the total outlay for DIStrict Flanning is allocated to the DPBs. The remaining 80% outlays is for normal district level schemes which are implemented through the heads of departments. Of the 20% outlay under DPBs disposal 15% should be spent for the

DPBs can finance schemes on 100% basis without any need for popular contribution to match it. The remaining 5% be outlay the DPBs need to/spent on incentive schemes which need to be matched by public contribution on 50:50 basis and on 75:25 basis depending on the backwardness of the talukas. Also the Talukas covered under DPAP, DDP, and TASP are declared as backward whose popular contribution is of 25%. In their enhanced role the main functions of DPBs are specified as:

- (1) to prepare perspective plan, five Year Plans and Annual Plan of the district.
- (11) to frame opecific schemes in various fields to be funded from the outlays under decentralised district planning.
- (iii) to ensure maximum participation from local bodies, public and voluntary agencies.
- (1v) to undertake a regular review and evaluation of district level schemes.

Bosides these functions, the DPTS are entrusted to monitor the Pinisus Beets Fro recove in the district, to identify infrastructure support required to support the family oriented programmes, to conditor the progress of enti-coverty programmes in the district. The DPHs are askisted by two committees vis. Executive Figures Committee and Sub-Committee on compleyment generation. This

WAP\* - Draught Proport Area Planning.
100\*\* - Usset Devolopment Programme.
Adres - Tribal Area dub-Flan.

these committees are headed by the district Collector. The main tasks of the Executive Coumittee are to evaluate the proposed schemes of the upds, to give technical sanction, to review the progress of with MMP \* and other than limp \* programmes. The sub-committee for employment generation is expected to assess the skilled and unskilled manpower requirement in different sectors of the district and to provide the infrastructure for the tesining and implementation of the soil enployment projects in the district. At present the working procedure of in its in brief, is as follows. For district level schemes the Man invite schemes from District Officers and also famo district Panchayats. The Executive Committee scrubinisms, the proposals and after the approval of Mes the proposals are sont to the respective department at the state government and finally the entire district plans/ment to the state Flanning Roard/department. The outlay finally sanction to the Dris is distributed among the districts and then to the Talukas on the basis of their relative backvardness, which is boing decided on the bests of some selected oritoria. The UPBs are advised to relain only 2), to 33, of the Annual outlay at district level and distribute the remaining amount among the balukas. The DFRs are authorised to take up to the the acheses obvered under Minimum Needs Programmes (MMP) and also schemes other than under Hip. Majority of schemes are implemented through the District Panchayats. Inc district Conchayata distance the fund to the Taluka Eurobayat according to the school sanctioned for each taluka. A districtuise, neurose vice-Hilly to a Hill from Heals Fragramers.

break up of outlay for all districts is compiled at the state level and is supplied to all DPBs and to the concerned departments to facilitate the monitoring of the progress. The computer facility have also been availed in some of the districts. Some training programmes are also being organised for the personnel of DPBs. A state Minister is the Chairman of the DPBs and also have large representations from various groups like Panchayats, co-operative sectors, tanks, voluntary agencies etc. besides the official members of some technical expertise.

#### VI

# Heraevof the Frogress of Decontralised Planning in

Sujarat is designated as one of the beginner in the descriptional planning. It has a very old and with a first foundation Panchayati Raj system. Its model of District Planning courd is nightly appreciated and has been cated as a good example. For far these efforts have successfully been brought about the decentralised planning in the state?

To give a full justice to review the efforts made by the state Government it needs to have the detailed sion level studies analysing the role of poor people in the district level planning, the talues level studies (if not at village level) analysing the change in economic

"I fire after the introduction of decembralised

planning, the studies of factors which played a rote in bringing about the positive change if at all it is there and if not what detered it. Unfortunately such micro level impact studies are totally absent, hence one has to gather some observations on the basis of sporadic studies and on the basis of some official reviews made for the decentralised planning in the state. The latter however, can hardly be expected to be free from bias. The review of the efforts made for the decentralised planning in the state planning in the state therefore can be read as tentative.

Gularat efforts towards decentralised plauning has been rested at the District level particularly after 1973 when it was felt that lanchayati maj system alone cannot take the full responsibility for decentralised planning and it needs to be supported by a bureaucratic set up. The District Planning Board thus came into existance. One can make a very clear observation from the different phases of the process of decentralised planning as discussed in the last section in the state, that for some reasons the role of Eds has been sub-dued and instead the bureaucratic set up such as DPBs has been made powerful both in torus of administrative and financial powers over a period of time. This does not mend that the official efforts could not be successful but if that is so say i U soculd calst at all ? Ideally the bureaucrilic rate should be supportive to the democratic 6/ for tradity alling, apockt.

set up and it should not be the other way round as has been happened in case of Gujarat. The state unfortunately could not strengthen or improve the Pals's functions and it is felt that the bonafide intention of the State Government to increase neorle's participation in the developmental planning has not be succeeded. It is not mount here that to strengthen Fils tole 1. easier turn to strongthen the in it. But the more difficult would have been made possible to raise the level of economic development of the people at the grass root level. The weaknes of PMIs are very well analysed in the available literature and also in some official documents. The state could have played an important role in its first phase of brocess of decentralise claiming by making some efforts to overcome the weaknesses of the fills. The state has also some condusive factors for that vin. (i) it is a relatively a smaller size state and (11) the socio-economic structure in Rural Gujarat is not as feudal as in the other states like W.F. Bihar and M.F. The sta is also in an advantageous justion for having been collected th micro-Level data on economic and social backwardness. The I.G. Patel Committee for the Development of the backward area. provides Taluka wise information on the relative backwardness. The Committee also has identified 5% such talukas which need special development programmes. The village level data on 53 amountles compiled by an official agency

<sup>7/</sup> For example see 3.F.J. Shadpurla (ed.) Panchayati in and Aural Development, Common Wealth Publishers, New Delhi 1989. U. Gurumuthy, Fanchayati duj and the Weaker Jections, Ashish Publishin; douse, New Delhi 1987. Government of India, Planning Commission, deport of the Committee on Fanchayati day Institutions, 1978 (ashe): Hehte Committee).

<sup>2/</sup> Coverment of Gujaret, General Alministration Repartment, deport of the Committee for Development of Reckweed areas, Volument of Alexander Committee, eachire Lara, Candidage a 1984.

is an unique feature of the state. The state however, as it appears from the available facts has failed to take the advantages of favourable socio-economic structure to strengthen the PHIs and has also not used the micro-level information to make the decentralised planning successful at the official level. Some glimpses can be stated below about the strong and weak points of the efforts made for decentralised planning in the State.

- (i) Gujarat has stown a good amount of zeal and spirit in introducing decentralised planning process. It was one of the few states which initiated three ther Pancheyat Maj system as early as in 1963.
- the review of the progress of DPBs made by the (11)state particularly after 1980 when some financial powers were devoluted to them suggests that they have been highly successful in increasing the popular enthusiasm. It is claimed that (a) during the period 1980-81 to 1986-87 a total amount of 223.54 crores was alloted to DPBs. Of this; 220.50 crores has been disbursed by them. (b) during the same period Dris have taken up 78592 schemes of local importance and have been successful in raising the popular contribution against the set incentive outlays. Also some physical achievements by DPBs have been highlighted viz. 10317 class rooms have been constructed, 10518 new water works have been supplied, 2495 link roads and 3485 approach roads have been made. 1261 villages have been electrified for all purpose.

2/ Dec ". H. Girdbar and Dave, op.cit.

The official review has glorified the success of decentralised planning through DPBs in the state. The independent studies available on the other hand analysing the performance of the state in decentralised planning, show a dismal picture. It is a common observation from these studies that despite the claim of success of raising the economic development of the backward areas through efforts made by DPBs, the state still faces the problem of under-development in certain areas like Kutchchh.

Evidently a need for cetting up a special development board for this erea has been felt.

It has also been observed that the accessibility of the micro level data has not been used seriously by the MBs to understand the constraining factors for the economic backwardness in the Taluka and its villages and some very superficial efforts have been made to reduce the backwardness in the districts. As a result even today, the relative positions in terms of Levels of development of many districts have cithor/remained unchanged or have been deteriorated. To support this observation Some facts from the Centre for Monitoring Indian Sconomy 11/ publication on Profiles of Districts have been compiled. The index of lovels of economic development worked out by CMIS for 1985, a comparison of change in these indices between 1980 and 1985 and the relative change between 1980 and 1985 in the ranks of the 19 districts in Gujarat compared to 412 districts of the country have been compiled and have been presented in the Tables at the end of the

<sup>10/</sup> See C.H. Hanuman tha Rao, op.cit.

<sup>11/</sup> Centre for Monitoring Indian Economy, District Level Pals for Key Feenanic Indicators, November, 1987.

some general Laprovslom one can gather I now those tables are as follows: (1) will all fine and conducive set up of both FRIs and Drus the index of Level of economic development had been lower than the state average in 13 districts out of 19 in 1985. Seven districts of the 13 as districts even showed a lower level of development index compared to All India average index of the same. (11) If the district level development indices are compared for 1980 and 1985 only 5 districts viz. Bharuch. Guadhinagar, Kutchchh, Hajkot and Valsad shoved an improvenen in 1985 over 1980. All remaining 14 districts showed a lower level of index in 1985 relative to 1980. third observation can be made from the tables is that the ranks of 8 districts viz. Gandhinugar, Surat, Valsad, haruch, Kheda, Dhavnagar, the Dangs and Kutchchh kot improved in 1985 than in 1/80 relative to the 412 districts compared. The remaining districts reduced their rank over a period of five years. The data however may be considered outdated aggregative but it is difficult to look is reard for a very desirable change in the district level development indices in the last five years. The Jawahar Hojgar Yojana ho has raised a new hope because of its m intended operation through village Panchayat. It however, is too early to evaluate its role in the decentralised planning in the state and elsewhere. The present performance of the state in increasing the role of poor people in decision making process appears to be dismol. The relationship between PRI and DPBs appears to be dischotomous rather than complementary. The latter type of relationship however, narrows the gap between the centre and decentre and planning can be brought about to and for the people at the grass root level.

# Sumiana Up

Coparat although has made a stride in initiating. and sustaining the efforts to implementing the decentralised planning in the right spirit, all these efforts have not been brought about the desirable results. The economic disparity, an unequal opportunity, the Social and educational backwardness and poverty still persist in rural Gujarat. The lope for a successful decentralised planning is understood to be rested. upon the efficient working of the Panchayati 12 j in the state as well as in the country. The reasons are very simple that the system consists of the elected people who have roots in If the basic weaknesses of the PRI which however, rural areas. requires time and a strong political will, are removed the system can act as a best forum to increase mass participation in the development process. The state is not free from the inadequacies of PHI. An academic study on the four rural Panchayats in Gujarat has observed that these Panchayats serve the interest of only for group mainly of blg farmers and traders of upper class, the SC/ST members of Panchayats are selected by the slite group of the village, they do not represent the interest of poor in the Panchayat. Yet it is feit that

<sup>12/</sup> Gee Indira Hirway, Abolition of toverty in India: With Special deference to furget Fraue Agarman in Gularate, Vikas Publishing House Ltd. 1986.

of PMI, the latter decision he purpose of mass participation in the developmed dirming than it is done through
a bureaucratic agency. The ming the administrative
and financial powers be at been shared between DPBs and PRI
complement each other filure to raise people's awareness
and participation by the late despite it having a long traditio
of decentralised plane by suggests a dischotomous relationship
between the bureaucrate and popular elected set up to achieve
a same goal.

# Table-1.

# Districtuise Index of Levels of Romonic

Sr. No.	The first tender of tender	(Inder-All Inde
	Gendhinagar	307
2	Almedabad	301
3	Vadodara	<b>2</b> 90
4	Surat	138
5	Ve Lsad	103
6	Elwrugh	1.00
	State Average	.120
7	in Jio t	117
8	Jamnagar	110
9	Kutchheh	108
10	Junagadh '	10.5
11	Kheda	104
12	Bhavnagar	103
	All India Average	100
13	Surondranagar	98
14	Amreli	. 87
15	Mehsana	77
16	Sabarkantha	514
17	Banaskantha	l <sub>i</sub> g
18	The Dange	ly .
19	Fanchmaim Ls	39

Source: CMIE, District Level Data for Key Economic Indicators, November 1987.

Table-2
Districtwise Index of Economic Davelopment
(1980 and 1985)

		The second secon	men menenant proposation of the other measurement of
Same and the second	The control of the second seco	Index-All Ind: 1980	ia = 100 1985
K. (1996年2月25日) 1996年1日 1996年1日 1996日 1	Alegoria	377	301
e e	Anreli	109	87
3	Eanaskantha	52	lig
1.	Blan recell	118	121
5	lhamagar	107	103
6	Gandhinagar	301	307
7	Jamagar	132	-110
8	Jangadh	123	105
9	Kutchhch	107	108
10	Khoda	107	101+
41	Mahesona	86	77
12	Pancimahala	49	39
13	lia jko t	135	1777
<b>1</b> 14	Sabarkan tha	82	<b>54</b>
15	Surat	143	138
16	Surendranagar	107	98
17	The Dange	35	143
18	Vadodara	. 234	201
19	baetaV	120	121

Source: CMIE, District Level Data for Key Economic Indicators, November 1970.

Tebles

Reaks of the Districts in Economic Development

Lance of the Districts of the Country

O o	III. II to see to the to the termination of the ter	5.50 k 1980	. 3 . 1. 12 1965
1	Gandhinagar		7
2	Almedabad	8	9
3	Vadodarn	21	
4	Surat	51	48
5	Valsad	79	65
6	Bharuch	84	67
7	Hajko t	<b>55</b>	. 71
8	Jonnagar	59	80
9	Junagadh	68.	87
10	Kheda	106	, 89
11	Bhaynagar	107	92
12	Surendranager	104	106
13	Amreii.	100	130
14	,Mehsana	155	160
15	Sabarkantha	167	233
16	Banaskantha	205	202
17	The Dangs	352	316
18	Pancimahala	207	330
19	Kutchheh	105	83

Source: Chie, District Level Data for Key Economic Indicators, November 1987.

# Table-4

# Indicators and their Weights Used for Computing the Index of Levels of Development of Districts

Indicator			were after and after and acts	
<b>**</b>	Assil			۵
	(1)	Per capita value of output of 26 major crops: Average of 82-83 to 1984-85	25	O
	(2)	Per capila bank credit for Agriculture June 1983	) <b>10</b>	0
II.	Mini	ng and Kanufacturing	25	30
	(3)	Number of mining and factory workers per lakh population 1984	10	12
	(4)	Number of household manufacturing workers per lakh of population 1981	5	6
	(5)	For capita bank credit for manufacturing sector June 1983	10	12
III.	Barr	tica Bactor	<u> 1</u> 0	. <b>72</b> 0 -
	(6)	Per capita bank credit June 1983	15	æ
	(7)	Per capita bank credit t Services June 1983	o 15	3
	(8)	以teracy (%) 1981	4	7
	(9)	Urbanisation (%) 1961	6	11
Tota	L .		. 100	100

Source: CMIE, District Level Data for Key Economic Indicators, November 1987.

# Decentralised Planning in West Bengal: An Overview Rathindranath Paul

Introduction:

Decentralisation of planning appears to be the talk of the whole country today. This concept was introduced in the Indian planning arena long back with the initiation of Community Dayelonment Programme. It however lost its appeal somewhere along the way. But once again it has started gaining attention. Very recently the central government has started trying to revitalize the concept in the Indian polity. It has so much populist appeal that all political parties have talked about decentralised planning, power to the people. Because of its tremendous capacity to attract the masses it has become one of the main slogans in election campaign in the country of the so called biggest democratic system. The concept of decentralised planning means decentralisation of decision making power to the grass root level, giving the people economic political nower to decide their own fate. In many states in India implementation of decentralised planning has already started. But according to the exparts their achievements are fer short of the expectations. Among all the states in India, Gujrat , Karnataka and West Bengal are the three states which are performing well in this regard.

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West Bengal is being ruled by the Communist party and it would be interesting to see how well the followers of democratic centralisation are implementing decentralisation in planning.

West Bengal is one of the states alongside Karnataka where decentralised planning, though introduced very recently in 1985, has been implemented with a lot of high hopes of the masses and it appears to be quits successful in practicing decentralisation in planning process and devolution of power from the state to local level institutions.

To understand the clear picture of decentralised planning process it is necessary to get an overall picture of administrative and organisational structure of planning and panchayat bodies in West Bengal.

## Organisational set up for state, district and block level planning:

As in other states there is a State Planning Board in West
Bengal. It is an advisory body which helps and guides the District
Planning Committee and Block Planning Committee and State Departments
in formulating and implementing the plans. The State Planning Board
also undertakes the exercise of continuous appraisal in addition
to the monitoring done by various authorities at various levels.

At the state level there is another body called Development and Planning Department. It is an administrative body which is responsible for the formulations and coordinations of the State Plan depending on overall guidelines.

At the district level there are also two planning bodies - Mistrict Planning Committee (District Plan Formulating body) and District Planning and Goordination Council(Mistrict Plan approving body. In each

district about five years back, the District Planning Committees were set up with the Zilla Parisad Sabhadhipati as its Cheirman and the Elstrict Magistrate as its Member-Secretary. The other manhers are on the one hand, the Heads of the Standing Committees of the 2411a Paricad, the Sabhapatia of all the (Block-level) Ponchayat Camitis and the Chairman of Minicipalities of the district and on the other hand the district level officers of all the Edpartments and the representatives of the Statutory Dathorition in the district. The necessary technical and adminis-Crotive support is provided to the District Planning Committee (EDD). The EDD is regarded as the real executive arm of the bigger genreal body District Planning and Corrdination Council (EPCC) which has the members of DPC plus the minister(s) hailing Srow the digerist as its Chairman (on rotation if there are several ministers) , Mila Parisad Sabhadhipati as its Vice-Chairman and the Matrice Medistrate as its member-Secretary.

Similarly at the level of each block within the district, a Block Flanning Germittee (BFC) has been set up with the concerned Panchayet Satisfa Sabhapati as its Chairman and the Block Developmas Officer (C.D.C.) as its Member - Segretary. The other mambers are the block-level officers of all the departments. The necessary technical and edministrative support is again provided to this B.F.C.

Panchayat bodies are an integral part of the decentralised

Planning Rochatism in West Bengal. There are three levels of

panchayat bodies - Gram panchayat (Consisting of group of villages),

the lewest ties, Panchayat Samiti (consisting of all gram panchayats
in a block), the middle tier and Zilla Parisad (consisting of all

the Daschayat Scaltie in the district), the highest tier of Penchayat

Bodies. All these bodies are implementing bodies of various schemes for rural development. They are have their own justship-tion of limits in terms of implementation. These limits depend the costs as well as benefited areas. Through the projects , salient Features of Decentralised Planning in West Bengal.

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(a) The vericus plan scalmen are classified into two categories vis. state sector schemes and district sector schemes on the basis of location and coverage of benefits. Normally those schemes are classified into district sector whose benefits are largely qualitied to the boundaries of the district. The rest of the schemes are classified as state sector schemes.

- (b) There are ceptain criteria (for e.g. total population, printip population of the district and certain development indicators) this are followed to distribute total district sector outlays to the districts.
- (c) The coordination among different levels of Panchayat bodies are maintained by giving membership to the head of the wath panchayat body for the higher level panchayat body.
- (d) All the common properties (under the ownership of the government) are handed over to the village panchayat for management purposes and they have been given the right to collect various kypos of taxes for mobilizing rescurces.

The government also gives matching grants egainst the callection made by gran penchayatinax. limit Rs. 5000/-)

(e) Apart from the funds of diverge departments/enthorition a separate budget head has been introduced known as District Planning Scheme (DPS) fund. And this is the fund which Edstrict Planning Committees use according to their own choice and preference and DPC holds exclusive power on this fund. (f) Each scheme of every department at the district and of the block leval is completely indentified in terms of physical targets (quarter - wise) and source of funds with implementing agencies. (g) Monitoring Powers have been entrusted not only with the implementing agency, but also with the block planning Committees and the district Planning Committees depending on whether the schemes are block level or district level scheme.

- This monitoring can be conducted quarter-theo and the regults of monitoring from each district can be reviewed at the state level.
- (h) The ultimate accountability of this depentralised Planning exercise is given to the people. Thore is a regular arrangement for auditing of all expenditures incurred by the panchayate. In addition there is a direct mandatury procedure of accountability to the people. As least two public metings are mandatory on the part of each Gram Panchayat - one to discuss with the general prople the solection of schemes and the other for presentation of accounts of expanditure.
  - (1) Emphasis has been given on smell revings programme as a part of resource mobilisation in panchayets and minicipalities.
  - (j) In the approach to development Planning, two things have been given highest priority - land reforms in agriculturo and development of small scale units in industry. Land reforms have

been treated as necessary productive move to reduce the existing unequal distributions of productive assets in agriculture.

Development of cottage and small scale industries is considered to be the appropriate area where scope of creation of gainful employment opportunity for the ever growing unemployment.

### An appraisal of decentralised planning in west Bengal:

Though decentralisation of planning in West Bengal has started very recently and it is in the phase of initiation (according to the working group on Decentralised Planning 1984), the success of the government in this respect is undeptable. This has been reflected in various studies done by several government and private organisations.

According to scholars in the planning arena the land reforms should be given utmost importance to make the planning successful. If this is true definitely west Bengal has achieved an underiable progress. With the implementation of land reforms in West Bengal, according to National Sample survey data nearly 60% of the total land has come to be sweed by the small and marginal farmers as against the national figure of 28.8% as owned by the small and marginal farmers of those households benifited, those belonging to the SC and ST comprise nearly 56% which is more than double their percentage representation (i.e. 27.6%) in the total population of the state.

It is also claimed by the government that it is on the basis of land reforms and the provision of non-land inputs through imphasis on technology transfer it has been possible to increase the

state's agricultural production in recent years, from a level of about 75 lakh tonnes in 1976-77 to 103 lakh tonnes in 1977-88 and to an anticipated all time record level of 109 lakh tonnes in 1988-89. Side by side there has been an increase in the purchasing power of the common people as indicated in terms of an increase in the average wage rate for agricultural workers from about Rs. 5.60 in 1976-77 to more than Rs. 16.00 in 1987-88, with the wage rate crossing over 25.00 in some of the districts.

In a NABARD sample study on the implementation of Integrated Rural Development Programme in the 15 states of the country it has been found out that there was no case of wrong identification of benificiaries in the district of Kest Bengal. It has also been observed by the same study that the association of bank staffs and Gram Panchayata in the identification of the poor families as has been done in Mest Bengal, may ensure that the benefits of the programme go to the observing persons. The sample study also indicated that the percentage of beneficiaries, who crossed the poverty-line is 2nd highest in Mast Bengal (Punjab ranking first).

district sector cutlay to total state plan cutlay was not more than 30 %. In 1988-89 and 1989-90 in has increased upto 40 % respectively. State government is hopeful that the percentage of devolution of the state's total annual plan to the districts will be increased from 47 % as at the year of (1989-90) to more than 50 % in the next financial year. This reflects continuous efforts of the ntate government to devolve economic power to the lower levels.

Table - I

Percentage of Matrict Sector to State Sector Outlay

Year	State Sector (Ro. in crore)	Rs. in crore)	% of Dist Sector to State Sector	Total (Rs. in crora)
1985-86	805	171	25.3	675
1986-87	553	223	28.74	776
1937-88	612	250	29.0	862
1988-89	673	270	40	943

Table - II

Percentage of D.P.S. Fund to District Sector Cutlay

Year	D.P.S. Propose	. Pend >>Actual	Mist. Sector outlay	Dist Sect	S. Fund to or outlay
L985-86	THE PARTY OF THE P	20	171	IProposed 11.84	-Actual/ 11,69
L986-87	7 30	12	323	9.29	3.72
1987-88	3 24	10	250	9.6	7.2
1988-89	) 27	21	278	9.71	7.6

The above success-story does not indicate that the decentralised planning mechanism and process followed in the state of west Bengal is flowless or ideal one.

Though state level Planning bodies clain that they have fixed certain criteria to identify the backwardness of the districts for distributing funds alloted for district sector outlay, a case study on one of the districts (Howrah district) in west Bengal shows that the D.P.O and departmental officers are unaware of it. It is very difficult to explain why this thing happened. It is definitely better on the part of state Planning bodies to make the district level officials aware of how the distribution of district sector outlay among the districts is done. Otherwise district level officials and people will be doubtful about the real intention of the state level planning bodies.

In contrast with the state of Gujarat, there is no specific criteria in West Bengal to distribute funds among the talukas/blocks in a district in the state of West Bengal.

In case of decentralised planning spatial distribution of outlay plays a very important role in reducing, the imbalance among the regions. In West Bengal while state heads of the departments communicate the district allocations to their counter part in the districts, no assessment is done to know the relative needs of the districts. Still higher level authorities do not want to loose their hold in discussion with lower level officials. That is why there is a bigh gap between sectoral demand of the district and the district level departmental allocation. Similar problems are also seen in the Rathindranath Paul; Decentralised Planning in West Bengal: A case study of Howrah District; Unpublished Missertation, CEPT, Ahmedabad, 1989.

case of Karnataka, supposed to be one of the good example of successful implementation of decentralised planning.

To maintain the localism is very important in decentralised planning. As in Gujarat (Discritionary and Incentive Outlay ) and Karnataka (district sub plan) wast Bengal also has a seperate budget head called District Planning Scheme Rund or in short DPS fund (as mentioned earlier) to maintain the localism . Though it is higher than that of Karnataka (5 % of the total district sector outlay) it is really meagre (around 10 % of total district sector outlay is DPS fund) compared to Gujarat, which is 20%, of the total district sector outlay. From the Table II it is found out that though the amount of DPS fund has increased year after year percentage of ops fund to total district sector outlay has become, almost stagmant for last 3 years. Another interesting thing in this regard is that the amount which is released is far less than which was promised. This is explained as the successful blocking by bureaucrats in writter's building (state head quarter) of progressive release of the Bind. This large dichotomy between the amount initially promised and the amount actually released is demoralising the district and block planning authorities.

In 1985 the district planning authorities were promised with some additional staff at the district level head quarters which

<sup>\*</sup> Arun Ghosh: Decentralised Planning: West Bengal Experience E.P.W., Vol. XXIII No. 3 , March 26,1988.

includes sub-Assistant Engineers (SAEs) and account clerks. The proposals, approved by the West Bengal Government as a far back as 1985 were not implemented until very recently because of the puscile objection raised by bureaucrats at the head quarter that the new pernonnel cannot be recruited except through the public Service Commission. When exparts of different fields are needed in lower level for proper implementation and evaluation of the programmes this type of attitude will definitely go against the main idea of decentralised planning.

Smooth and sufficient supply of money to the lower level planning bodies is highly important in decentralisation of planning and without this talk of decentralisation is meaningless. One study has has shown that all the district level as well as block level officers are always facing acute shortage of financial allocation either from the departmental head or from other financial institutions. Again whatever amount is sanctioned does not come in proper time as a result of which either developmental programmes are hampered or cost increases twice or thrice the actual cost of the projects. This has also created the scope for political patronage.

Though West Bengal Government has been compaigning in favour of land reforms and trying to focuss on their achievement in this regard S.R.Osmani has summed up the findings of different surveys done by Bandopadhyay et. al (1985), Westerguard (1986) and Kohli (1987) as I Inspite of the fulfilment of the condition of

countervailing power tenants are in general reluctant to break up the traditional landlord tenant relationship, except in the case of absentee landlordism where this relationship did not in any case exist to begin with. The clue to this apparant paradox, according to him related with two factors: (a) the apprehension of the tenants of the consequences that might befall them once the parties more favourable to the landlords return to the power and (b) non-fulfilment of a successful tenancy reform - the assurance of an alternative source of material support. He explains ".....it (tenancy reforms) seeks to improve the security of tenants by freeing them from the clutches of the landlords but the tenants will refuse unless there is prior provision for adequate social security......One can not therefore avoid conclusion that the immediate political limit of tenancy reform in a state like west Bengal is not much above what has been achieved so far.

Day by day corruption is increasing in each and every espect of life which according to the Marxists, is the result of the crisis in capitalist economy. While no part of the country is able to avoid corruption and while central government itself, had been occured of corruption, the state of West Bengal is not an exception. Panchayat bodies in many cases have been charged by different political parties for misuse of public monsy. In many cases panchayat representatives have been charged for eating up the money which is supposed to be used for various developmental programmes. As a result the resource does not get utilises properly.

If we compare with the performance of some other states in India it is beyond doubt that West Bengal has done quite a lot regarding the implementation of decentralized planning but it is far from large budgetary gap (b) lack of autonomy and high dependency of local level planning bodies on higher level authorities for resource and exploitation and corrupt practices not only by the efficials but also by the party workers which is creating hindpance against the philosophy of using various relief schemes for the toiling masses to the maximum possible extent. So shill it has to go a long way to be really successful one.

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# RESOURCE PLANNING AND MANAGEMENT - AN ANALYTICAL APPROACH TO REGIONAL DEVELOPMENT

C.R. Pathak\*

### 1. Introduction

Resource planning is a rational inventory for its efficient utilisation for the well being of the human society. Management relates to minimisation of waste in production and consumption, conservation of valuable resources, and preservation for future use by discovering substitution replacing the non-renewables by the renewable resources. Productive power of natural, human and man-made resources are to be maintained and developed through positive control and direction.

Exploitation of natural resources leads to economic development where as its over-exploitation leads to exhaustion, ecological imbalance, and environmental degeneration.

The natural resource endowment is a dynamic concept and the resource potential of a region could be enhanced by its development and discovery of newer ones. Uptill now more importance is given to the conservation and management of non-renewable resources because of its scarcity in supply and its non-replacability but the renewable resources need also serious attention. A sustainable path of development is to

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be designed through continuous regeneration of renewable resources to remove income disparity between and within the regions.

The main thrust has been given here on the natural resource planning and management for regional development with particular emphasis on energy resources. The energy resources provide the foundation for economic development, automation in transport, domestic lighting, cooking etc. and are needed for the extraction, processing and utilisation of other resources. An integrated approach to the conjunctive use of all energy resources for regional economic development is called for.

### 2. Regional Economic Growth: The Conceptual Framework

The regional economic growth takes places at the impact of two types of forces — one those relate to the growth impulses generated from inside and the other those exogenously set from outside, although there is no decernable dichotomy in them. As a matter of fact both the forces are complementary to each other and could be distiguished only in terms of their relative role in regional development.

Regional development as an integral part of national economic development has an objective of long term improvements in the welfare of the people and achieve equity in the share of national wealth. Such equity is viewed in the perspective of balanced regional development. Growth has

a tendency to occur at certain centres/areas favoured initially with various types of economies such as economies of scale, external economies, initial leadership, comparative advantages in terms of resource endowments, etc. Such growth overtime gets "polarised" and applomerated creating regional disparity in the levels of development. Of course theoretically speaking such growth would be supported by "trickle down" process or "spread effect" to ultimately achieve balanced development given unlimited time frame. But no region would have time to wait for such a long time nor would it work in a systematic way. The regions thus developed go on developing and those lagging behind would suffer on the long run unless some deliberate action is taken to reduce the development gaps between the "advanced" and the "lagging" regions.

E.M. Hoover, Joseph Fisher 1 have observed that a region grows in sequence of development stages. To start with a region may be having a self-sufficient subsistence type of economy and the population is distributed according to the distribution of natural resources. With the development of economic infrastructure and transport network, the region produces surplus in some products to trade with the neighbouring regions and starts specialising in some product say, agriculture or extractive industries. Multiplier effect generated from such regional surplus product from interregional trade would raise income and employment level of the people. Such development would lead to diversification of

the economy and specialisation in some product leading to higher level of economic development followed by the reorganisation of population distribution and urbanisation by rural-urban migration and industrialisation. In this process of regional economic development, the transport and energy resources play a vital role and resource potential gets enhanced leading to continuous development.

Similarly, to explain the mechanism of regional growth, North<sup>2</sup> has developed the theory of economic Base. It states that by exporting natural resources, surplus is being created. The effect is to increase the propensity to import as well as some inflationery pressure pushing the wages higher and creating employment opportunity for the migrants. Increased import will stimulate new activities, be in the field of import substitution. Thus cumulative process sets in with new enterprise and a new class of industries will be attracted. Such industries if diversify the export basket, the regional growth will be continuous. However, there might be some problems in case the resource endowment exhausted or there is sudden change in the demand structure of such resources, or if the socio-political condition of the region is not conducive to the establishment of activities, the region may slump back into stagnation.

W.W. Rostow has developed the stages of Growth Theory in similar line. He has propounded that a region grows  $^{10}$  sequential stages from a subsistence economy to a more

advanced or matured one based on the product diversification and specialisation.

According to him, a region passes through the following statges:

- (i) Traditional Stage a region having untapped resource potential and with little external trade will have a subsistence economy. The region produces as much as it needs or in other words, the level of demand is determined by the availability of regional produce.
- (ii) Transitional Stage: The subsistence economy gives way to the extractive or processing economy with the growth of transport network and opening up the region to external trade. The region with its comparative resource advantage or surplus generated from such extractive economy enters into inter-regional trade with some export possibility.
- (iii) Take-off Stage: The growth of the primary sector and trade benefit would shift the secondary and tertiary activities of processing type supported by the external economies and transport and other infrastructural development to product specialization once the regional economy takes off, it would lead to next stage of development.
- (iv) Drive to Maturity Diversification of regional economy with balanced sectoral development between the primary, secondary and tertiary sectors would lead to highly specialized activities.

(v) The State of Mass Consumption: The specialization and diversification work hand in hand leading to tertiary sector expansion. This stagial growth process is being supported by division of labour, diversification of the employment market and urbanization coupled with the migration of people. The location factors such as transport cost, availability of power, etc. would create industrial clusters and territorial production-cum-urban complexes. In spite of many limitations to the above mentioned mechanistic growth theories, the generality is observed in the growth process and is far from spontaneous. The growth need to be guided with the introduction of technological innovations, entrepreneurship development capital investment, and above all the regional socio-political structure should support such growth.

What is the prime mover in the regional growth process is the resource endowment and how much endowment is being utilized by the people for sustaining the development. Misuse of resources, or wasteful utilisation may exhaust the resource base or the development is delinked from the resource structure. Under such circumstances, there is a need to make correct inventory of resources, utilise them most efficiently and minimise waste. If the natural resources are exhaustable and irreplacable, substitutions should be discovered and conserve the valuable resources for future need.

## 3. <u>Regional Resource Structure and Pattern of Development in India</u>

From the theoretical construct stated above let me turn to the Indian situation. It has been observed in India that regional development has taken place based on the resource endowment and some regions have developed to some extent, while many of the regions are still lagging behind.

regional number of studies have been made on development in India but these studies have not analysed the linkages of the development with the resource base. Patterns of regional development emerged during the last forty years of planned development are of unequal or imbalance nature and are the results of national policy directions towards resource utilisation to raise national income with particular emphasis on increasing production, employment generation and removal of poverty. Although reduction of inequalities in income and wealth and more even distribution of economic power were the main corollary to national development policy, economic disparity accentuated. Social content of Indian economic planning being weak, the majority of the people remained deprived of the fruits of development and glaring regional disparity resulted.

If the development has to be rooted in the resource base, there is no other alternative except to adopt regional approach to national development. In India there is a network system of inter-connected elements of regional frame evolved through multi-level planning frame work. This

territorial system includes the villages as planning units at the bottom to C.D. Blocks/Taluks, to districts, state, Inter-State and urban/metropolitan regions ultimately integrating the space economy to the national planning for economic development at the hierarchical framework. administrative units have been used to regionalise and to identify various types of regions. On the other hand, regional planners have identified planning regions on the basis of levels, of development and planning problems - such as dynamic, prospective, problematic and even frontier Besides, regions with specific problems such regions. socially and economically backward regions viz., tribal regions, hilly regions, etc. have also been identified. regions based on resource endowment are also identified, such regions are resource specific, and location of such resources are space bound. Resource exploitation and management for development should be carried out through spatial planning approach. The human activity pattern should be integrated with the structure of natural resources and then only the economic development will be endogenous and self-sustaining.

In 1962,4 the Regional Survey Unit of the Indian Statistical Institute prepared a tentative regional framework for resource development based on synthesis and analysis of physical resource complexes, cropping pattern, mineral wealth physical resource complexes, cropping pattern, mineral wealth and urban-industrial development. In Indian regional and urban-industrial development also formulated such as planning, many adhoc regions were also formulated such as S.E. Resource Regions, Dandakarnya Region, etc. based on

natural resource potential, but no actual plan for development was prepared or implemented. The resource regions thus identified had industrial raw material and potential for power resource development. In other words, the regional development cannot succeed without the planned utilisation of the natural resources.

Some of the resource rich regions of India such as the central India, N.E. or the Foot Hills of the Himalayas are quite backward. The backwardness is the result of cumulative process of under-development where neither the regional economy nor the society are geared to development. effects become the cause and there is to other way out except a drastic intervention with a "big push" to the regional economy with heavy capital investment. The absorbing capacity of such investment is low, infrastructure is poor, initial constraints to development are formidable but real thrust has to be given to the resource development and exploitation to breakway from the backwardness. It is paradoxical that the backward areas being endowed with rich resource potential could not be developed where underdevelopment is increasing and stalls the development process. Rosenstein-Rodan's concept of "Big Push" theory need to be applied, otherwise if the backward regions are left to themselves to the evolutionary development process, the backwardness itself will stand on its way to development.

Many planners have opined that the lack of infrastructure is the stumbling block to the development of backward areas but if infrastructure is developed without the planning for structure of economic development which would require such infrastructure, it will strengthen its backwardness rather than energise the regional economy. The development must be ingrained in the resource base.

The "Resource Endowment is continuously redifined by changes in national final and intermediate demand, production technology, and economic organisation. The relative growth or a region is directly related to its relative advantages in the production of goods and services for the national market, they may result from resource endowment on the one hand, or from a favourable degree of access to the national markets on the other - more generally, from a combination of the two" (Perloff) (Ibid).

# 4. Energy Resources: Their Sources, Utilisation and Significance

The level of energy consumption in a nation is the measure of its levels of economic development. The highly economically developed and industrial societies have higher level of energy consumption while the lack of it or low level of consumption characterise the relative backwardness of the economy of the developing countries. The production and consumption of energy in the form of mechanical power is very vital as an infrastructure for energising the national ecconomy. As a matter of fact, it is the foundation of

economic growth and fundamental to modern technology. The mechanical energy has its multi-farious use and keep the transport system moving and meet the domestic cooking, lighting heating, cooling and other human needs.

endeavoured to discover various sources and use of energy resources including that of his own and animals. Gradually, such animal energy sources such as living plants, water resources, fossil fuel, nuclear and geothermal resources. These resources are being tapped and the level of a particular energy resource development is closely linked with the level of technology applied in tapping such sources. A particular resource is being replaced or substituted by a more efficient one, greater is the efficiency of the resource, greater is it capital intensive and higher is the level of technology applied to its production. Out of the resources mentioned above the non-renewable resources have proved to be more efficient but their very nature called for conservation and preservation as they are irreplacable.

In the 19th century coal replaced charcoal and was supplemented by hydro-power, while in the twentieth century coal has been displaced from its supremacy by petroleum and natural gas and more recently particularly in the post-World War II period nuclear energy resources are being developed as the most efficient power resource. The present day world

economy and even the politics are being controlled by these latest two energy resources.

In India, in spite of our concerted effort coal remained as the vital source of power and constitutes about 65 per cent of our total energy supply despite the increasing production of petroleum and natural gas or generation of hydro-power. In 1973, our coal resources have been nationalised as we need to rely more on our domestic sources of power rather than depending on imported petroleum. In 1970, the production of coal has gone up to 196 mm. tons per annum and is estimated to produce about double the amount by 2000. The main demand for coal comes from railway which consumes 65 per cent of total coal, next are thermal power plant, steel industry, cement and chemical industries. As a matter of fact coal will remain at the core of power sector for the next few decates. Relative position of our power resources in terms of production are as follows.

Table 1

Sources	Generation of Power mn.kw. Resources 1960-61	1960-61 Per cent	1974-75 mn.kw.	Per cent	1980-81 mn.kw.
Hydro ·	1.92	33.9	7.52	39.4	4.07
Thermal	3.42	60.5	11.76	58.4	18.96
Diesel	0.33	5.6	0.23	1.1	<b>_</b>
Nuclear	_	-	0.62	3.1	2.20

In 1980's, there had been widespread deficit in supply irrespective of the levels of development in any region. Of course the demand had been more in the developed the country. In 1980-81, the actual production was 2523 MW. and has grown at 9.7 per cent annum against the need of 12 per cent per annum. generation in India had sizeable capital outlay in every plan, while it was 7.6 per cent of the total plan outlay in the first five year plan, it went to as high as 18.5 per cent during the fourth plan, unfortuantely the actual production never exceeded 50 per cent of the rated capacity. Energy requirements of the country by 1999-2000 is estimated as billion AWS of electricity, 188 mn tons of coal and 72 tons of oil. India is very much dependent on thermal power, the hydro power and neclear sources should be stepped up. meet the present need, India is very much dependent foreign import of crude oil which accounts for about 31 per cent of our demand. It creates balance of payment problems so need to develop domestic sources.

There has been regional differences not only in power generation but also in consumption. The Southern and Northern regions share 27 per cent and 25 per cent respectively of the national power production Eastern region comprises only 21.9 per cent and the North-East only 1.3 per cent. The demand has not come from the backward regions nor are they surplus in power production. As a development strategy, the backward regions should be given priority in

power production as its availability is a pre-condition to economic development not only because their power generation potential is high but because development could be geared with the power as an input rather than simply an infrastructure although the present day demand may be less in them. The development in such region could be rooted to their resource base.

### 5. Conclusions

Our policies for national development must take account the regional development. 8 Our national economy demands adequate resources in order that the supply energy, transport and other infrastructural facilities for sustainable growth at a fast rate. It is also observed that the demand for energy, and other development is increasing rapidly, so efforts should be made to conserve the use of scarce, capital intensive intermediate inputs (especially fertiliser, etc.) for reducing the amount of energy, additional investment needed. That there is considerable scope for reducing the energy input per unit of out put is well recognised. The above statements are made in Approach Paper to the Eighth Plan in which emphasis is laid more on social transformation strengthening the content of the development plans in which resource planning will get priority in regional prosperity.

Table 2: <u>Sectoral Share in Commercial Energy</u>
<u>Consumption</u>

		Commercial Energy			Specific Fuels in 1984-85			
		1 1979-80			Electricity	Coal		
Household	20.4	15.7	18.2	29	4	3		
Agriculture	3.6	9.4	7.8	10	16			
Industry	39.2	38.2	36.4	5	62	78		
Transport	33.8	32.8	31.4	56	2	13		
Others	2.8	3.9	4.2		•	6		
Total	100.0	100.0	100.0	100	100	100		

Source : Seventh Five Year Plan.

Table 3 : Estimates of Commercial and Non-Commercial Energy Requirements in 1999-2000

Energy		Sectors of	Consumption			
	House- hold	Industry		Agri- Others culture		Total
Electricity (Bn KWH) (Highest						The second secon
estimate)	83.5	282.8	8.9	41.5	48.0	465.0
Coal (Mn Tons)	14.0	161.0	7.81		5.19	
Oil (Mn Tons) Fuel Wood (Mn	17.73	12.0	29.66	8.1	5.0	72.7
Tons) Dung Cake (Mn	191.6	<del>-</del>	_	-	Teaching the second sec	191.6
Tons)	105.0		•	_		105.0
Vegetable Waste	59.0			-		59.0

<sup>+</sup> Net coal consumed in power sector.

Source : Same as above.

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## . CONFLICTS IN GEO-SOCIAL SPACE

# A RESOURCE CENTRIC APPROACH Tensing C. Podrigues\*

In this paper we attempt to construct a theoretical framework, based on historical experience, for seeking answers to questions like - how do fissures appear, manifesting as communal/ethnic /regional conflicts in apparently homogeneous societies? Why do many of these conflicts ultimately transform into struggles for political power and its extreme form secession?

The principal element of this theoretical framework is resources, where resources is defined as any matter capable of generating "utility". Utility is defined as actual or potential satisfaction of human wants.

Thus resources generate utility; this capacity of resources available for generating utility to humans at a given state of technology we call "negentropy".

As resources are used to generate utility, there is negentropy depletion.

3. Here we make our first postulate; that the objective of every human is to maximise the flow of utility to himself

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Though this is equivalent to rationality assumption of economic analysis, our comprehensive definition of resources takes us beyond the narrow domain of economic goods By inference this postulate would hold good also for groups of humans, that we call as communities

Now maximising the flow of utility to oneself would require a control over the direction of this flow, and the control over the direction of the flow is derived from the control over resources. Thus control over resources is a necessary condition for appropriation of utility.

By inference maximisation of control over resources is a necessary condition for maximisation of utility This strong dependency relation tends to degenerate into an identity relation. Consequently we find that control over resources becomes an objective of humans, independent of and at par with utility.

Now, negentropy depletion implies a reduction in capacity of resources to yield utility. Thus negentropy depletion is equivalent to loss of control over resources and adverse to the objective of maximisation of utility. Thus the objective of humans has to be extended to include minimisation of negentropy depletion

4. Secondly we postulate an ordinensional space in which resources and humans are located, and across which the utility flows from resources to humans, and control from humans to resources. Let, us call this space "geo-social space".

The principal dimensions of this space are:

(i) The two dimensions of the geographical plane. These are relevant to both resources and humans. Both resources and humans are distributed over this plane in such a manner that there exists a one to one correspondence between resources/humans and points in this plane By inference there exists a one to one correspondence between sets of resources/humans and sets of points in this plane. (Fig. 1)

The sets of contiguous points in this plane we may call regions. The set of humans we may call communities and sets of resources we may call resource complexes. In fig.1. community Ci is an image of region Ci in humans and viceversa; similarly, resource complex Ri is an image of region Ci in resources and vice-versa.

- (ii) The relevant dimensions of the "social space", where social space is defined, again, as a n-dimensional space in which humans are located. The principal dimensions of this space relevant to this study are
  - (a) the religion
  - (b) the caste
  - (c) the economic status
  - (d) the ethnic/cultural denomination
  - (e) the political status
  - (f) the occupational group

This space is not relevant to resources. The humans are

distributed over this space in such a manner that there exists a one to one correspondence between humans and points in this space. By inference, there exists a one to one correspondence between sets of humans and wets of points in this space. (Fig. "2) Thus it is possible for us to identify a particular community with a particular "social group" , that is, a religion. Conste. economic class: (pour, rich etc.). ethnic /cultural denomination | lencilbational eredt: opensants ... landowners industrial workers; Thraders. or political construct (political party state government, union government, members of legislature, etc.) in the 2 social group Si is an image of community Ct in social space, and vice versa.

- distributed over geographical plane that there exists a one to correspondence between cets of resources (resource complexes) and sets of contiguous points in the geographical plane (regions) and between sets of humans (communities) and regions. Thus, by transitivity there would exist a one to one corespondence between communities and resource complexes. (Fig. 3) It should be noted that this correspondence does not imply ownership, that is, legal right to usuffect and disposal, or, what we have called in 3 above "control over resources".
- 6. Now, sometimes, the humans are so distributed in the georsocial space that a community corresponding to a given social group may also correspond to a given region or another social group. For instance a community professing a given religion may

mean that humans professing a given religion are located in a given region (Fig. 4). Or we may find that a community belonging to a given political construct corresponds to a given economic status.

In practice this correspondence may not be absolute of total; that, each numer from a community located in a given region may not profess a given rengion; or each human from a community corresponding to a given political construct may not belong to a given economic class. (Fig. 5) But the logic of our enalysis is found to hold good when the correspondence is true of a dominant sub-set of the community.

- T. Now we come to the control of humans over resources, flow of utility from resources to humans and degentropy depletion. Here we have to note a few basic facts:
- (1) That the control of humans over resources and flow of utility from resources to humans are relations between humans located on the geographical plane and in social space and resources located on the geographical plane
- (ii) That a human located at any point on the geographical plane may control a resource located at any point on that plane; similarly, the utility from a resource located at any point on the geographical plane may flow to a human located at any point on that plane
- (iii) That the utility generated by a given resource/s may not always flow to the human/s who control it; this utility may be traded to obtain utility generated by another resource/s

controlled by another human's Therefore control over a resource implies a control not only over the flow of utility generated by that resource, but over utility in general.

- (it) That, like utility, control over resources is also traded
- (v) That the control over a given resoursee/s may be shared by two or more humans or communities. More relevant to our analysis is this latter case where two or more communities, share the control over resources. Government control over industry is an example; farmers marketing their produce through traders is another instance, here of an indirect control

As we have said earlier, control over resources implies a control over the flow of utility generated by those resources. Thus the distribution of control among the communities, determines the distribution of flow of utility to those communities.

Sharing of control determines the distribution more through the trade of utility since it determines the terms of this trade. Greater the control of a given community (in relation to another community) more favourable are the terms of trade to that community.

Sometimes a given community may use its control to direct the flow of utility towards, or turn the terms of trade in favour of, another community. This occurs usually when the controlling community is a sub-set of the utility receiving community liere too, as we have seen in (6) above, the entire controlling community need not be a subset of the utility receiving community; it is sufficient if a dominant sub-set of the controlling community is a sub-set of the utility receiving

community. For instance, a political party deminated by humans belonging to a certain economic class may enact policies which favour that class

6. In 3 shove we have noted that there exists a correspondence between communities and resource complexes. We have also noted that this correspondence does not imply that a given community has a control over corresponding resource complex. This is in conformity with the basic fact noted at 7(ii) above

Nevertheless, this correspondence is "real", and not just an analytical abstraction There exists in the collective subneonscious of the community a "natural" claim to the control over the resource complex coresponding to it. We have called it natural to distinguish it from a legal claim, and also to point to the fact that it is a vestige of a primordial paradigm of control over resources. In this pre-capitalistic paradigm, control over resources was not a community and therefore could not be traded. Thus the basic facts noted at 7(ii) and 7(iv) above were not true.

In a modern capitalistic paradigm where 7Gi) and 7Giv) are true, there may occur a flow of utility from a given resource complex to a community which may not be identical to its image in humans. This situation can be observed in Fig 6 Ri is the image of region Bi in resources, while C2 is the community corresponding to it But the utility from resource complex Ri flows to community C1 which is a superset of C2. It is necessary at this point to distinguish between two cases where this may occur in the first case there may occur a flow of utility from Ri to C1. where C2 occi, as a result of trade

in utility community C2 which controls R1 may offer a part of the utility flowing from R1 to (C) - C2 ) in exchange for utility over which the latter community has control in this case (C) - C2 ) does not have a direct control over resource complex R1.

In the second case, to convois Rt and therefore receives the flow of utility from it. However on account of the "matural" claim of (2 to the control over the resource complex Ri. C2 looks upon the flow of utility from Ri to (Ci - C2) as a case of trade in utility and as such expects (Ci - C2) to pay it for this flow This payment may take the form of flow of utility or an addition to C2 's control over resources.

In both the cases, therefore, there is a trade in ntility between C2 and (C1 - C2), in the first case an actual trade, while in second case, a deemed trade, what is important here is not the fact that there is a trade, but the terms of this trade.

Like In any other exchange, the terms of this trade too will depend upon the relative position of the two trading partners. Now, this is determined by both endogenous as well as exogenous factors. Endogenous factor is simply the relative elasticity of demand.

To assess the effect of exchenous factors, we need to map C2 and C C1 - C2 ) onto the social space. Before doing that, however, we will turn to effect, of given terms of trade.

We have postulated in 3 above that communities maximise the flow of utilities to themselves. Therefore each community participating in the trade I that is G2 and (G1 - G2 ) I try to turn the terms of trade in its favour. For that they would order the terms of trade with respect to their objective, with the most desirable terms of trade at use end of the spectrum and the most undesirable at the other. Between the two extrema there will be some torms of trade which are just tolerable. If the terms of trade become more undesirable than this, a fissudre may arise between G2 and (G1 - G2), as G2 may look upon this trade as exploitative. This brings us to the answer to the first question that we posed in 1 above. Why do fissures appear in apparently homogeneous communities (like G1) ?

10. The most relevant question that arises at this point is how do we determine terms of trade that are "just tolerable"? There does not seem to be any easy algorithm to do this; the only option is to look out for manifestations of terms ofs trade crossing the tolerance limit. Since, given the cumulative nature of process of acquisition of control of resources, the terms of trade are likely to move over time monotonously in any one direction. ( that is, not oscillate ), this is a fairly good option. Fissures can thus be detected at an early stage and terms of trade corrected to avoid a further development of fissures.

To understand differences between tolerance limits of different communities, it may help to map the trading partners

(communities) onto the social space, overs a sufficientdly long segment of time, and look for factors which influence terms of trade ( we discuss this in 11 below). A long history of adverse terms of trade may either raise ors lover the tolerance limit.

11. As we said towards the end of 8 above, to assess the effect of exogenous factors on terms of trade, we need to map the communities onto social space. This would enable us to identify the relations between these communities and social groups.

Let us understand the effect of these relations on terms 01 trade with the help of an illustration In fig. 7. Ri and 1.2 are images of Gt in resources and humans respectively. Car controls Rt. and ofters a part of utility flowing from it, ( C1 - C2 ) ( where Ci is some superset of C2 ) in exchange for control over a part of R2 which is controlled 04 t where C4 A CC: C2 ) = = 0 ] Now C3 . Which is the image of social group. St in humans shares the control of 1 and R2 with C1 and C4 respectively. Now. C3 width is a subset of (Ct - C2), is a dominant subset of C3 thus induces C5 to control R1 and R2 in such manner that the terms of trade in exchange of utility from Ri for control are turned in the favodur of (C1 - C2 ). [Read over R2. 7(v)). To understand this complex illustration better, let present the same as a real life example: Let Ri be the land in G1 , used for growing wheat It is owned by C2 C2 of the wheat to (C) - C2), and buys agricultural inputs (reR2) from C4 CB is the set of individuals consmiting the

government (Si) The government has control over the prices of agricultural products as well as inputs Now C3 belonging to (Ci - C2) is a dominant subset of C5. It therefore induces the government to lik prices of wheat and agricultural inputs in such a manner that the terms of trade turn in favour of (Ci - C2)

This illustration leads as to the answer to another question we posed in tabove why do many of these conflicts dike C2 vNs (C1 - C2) transform into struggles for political power ? Once C2 realises that the exogenous factor, that is, (C1 - C2 ) + C5 mapping, determines the terms of trade between itself and C1 - C2 ). C2 will try to either (1) penetrate (5) and dislodge C3 as the dominant subset of (C5, or (ii) reduce /eliminate the control of C5 over R1 and R2. Going back to the concrete example. (i) is the case of demand for "greater representation" while (ii) implies "greater autonomy or "secession"

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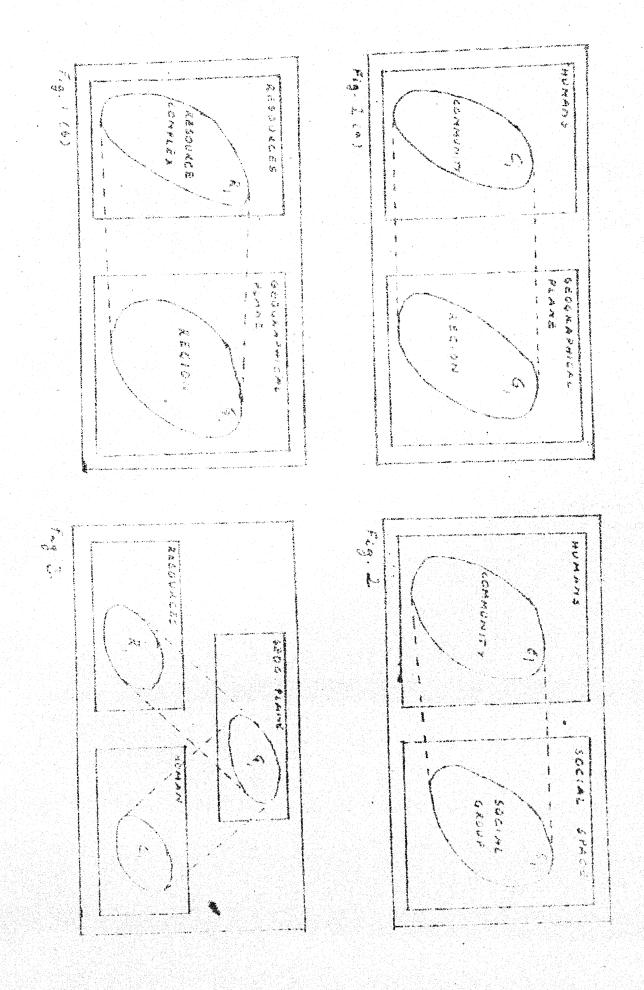
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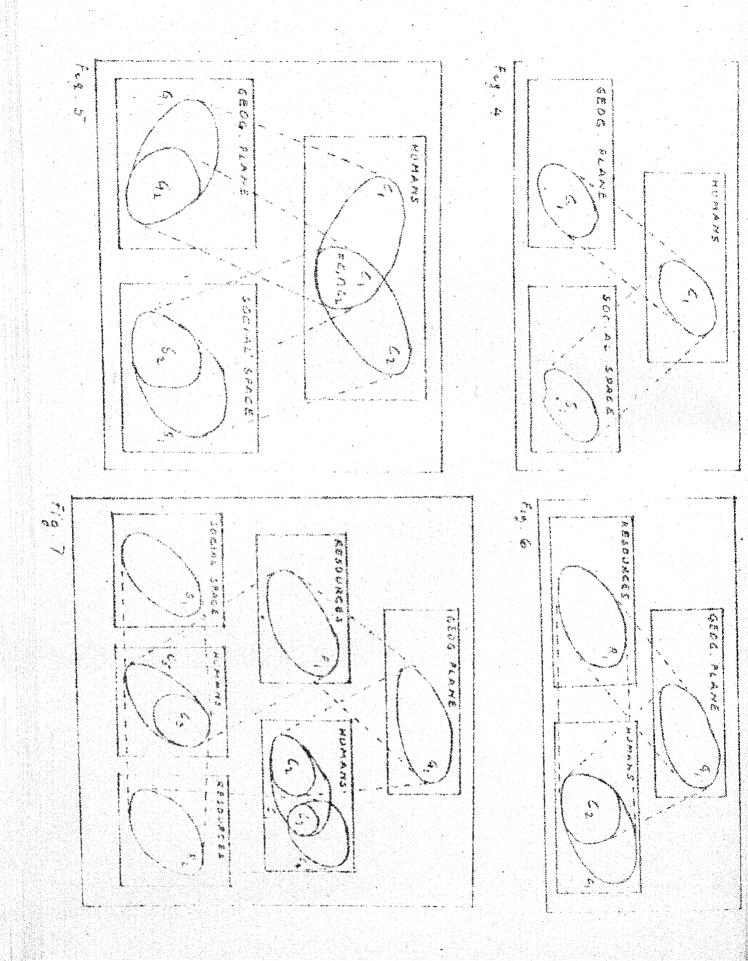
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Rejendra Menaria, Ph.D. F.M. Vyas

During the take-off stage in the new industrialized countries, important objectives were to increase production, productivity, national income and other related parameters. Population pressure was not too high, density of population was extremely thin and environmental implications of industrilisation or infrastructural development were too imperceptible to cause any concern in the mind of decision makers. Even in the developing countries, around the middle of this century, the primary concern was accelerating pace of development. Though high rate of population growth and its wide ranging implications for the economy caused serious concern, but environmental aspect remained relegated to the secondary position. However, after the 70s, environmental degradation, pollution and distortions in the sco-system haveassumed global dimensions, encompassing all the countries in the world, irrespective of their level of development.

It has been argued in some developing countries that the level of industrialisation or technology mix prevalent in these countries is less polluting. This sort of thinking is derived from the following table:

Table 1
Indicators Having Environmental Implications

Count ry	Percent of GDP originating in Nanufacturing		Pertilizer consumption 100 grams of plant nutrients per ha of	
	9€40 <b>9</b> 1965	year 1987	argile las	
India	22	30	210	521
Japan	43	41	3892	4221
U.S.A.	38	30	816	918

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	Consumption kg. of		per cent to	Per cent Urban population.	
	011 Equit 1965	valent. 1987	1965	1987	
India	100	308	19	27	
Japan	1.4.74	3232	67		
U.S.A	.6535	7255	72		

Source: World Development Report, 1939.

It is clear from the acove table that in relative terms, India need not worry about major pollutants like level of industrialisation, consumption of chemical fertilizers, energy consumption or urbanisation. These are only some out of many indicators which may lead to environmental pollution. These have been picked up only because details were readily available. It may be maintained that considering the above indicators, there is not ground for countries like India to worry about environmental implications of development. It is so because advanced countries like Japan and U.S.A. have already attained higher level without jeopardizing eco-balance of the nation. Such attitude on part of the daveloping countries may not be logical because in developed countries, all necessary precautions are taken to minimize the environmental implications. In developing countries, as a result of resource crunch, emphasis is given to rapid development while environmental consideretions in the shet run are ignored. In fact, options before the developed countries are wide open and they can afford to spare resources to guard against environmental degradation. The developed countries have all necessary wherewithal to combat environmental degradation as a result of development process. On the other hand, developing countries, even in the initial states of development utterly fail to adequately provide for environmental safequards. As a result, day doping countries are caught in the countries of low development

and righ environmental pollution. West they urgently need is to design a development process which is environmental friendly.

decision makers not only in the developing countries but also in the developed infustrialized nations. The It is a fact that environmental pollution often crosses national boundries, liberty taken with environment in one country causes adverse effects in reighbouring countries. As such first, developed countries have shown quester cootern for eco-balance in developing countries because 'queen house effect' or 'depleting onore layer' may cause catastrophic have engulfing entire world. Thus, we can say that, at least the prospects of environmental degradation motivatesall countries in the world to design appropriate strategy and rake concerted efforts in this direction.

It is expected, on past of the developed countries to share their to experiences and technical know-how pertaining to environmental issues with the developing countries. This has to be done as moral obligation and duty towards less fawourshly located countsis. In fact, present day developed countries prosperity rests on multipromyged exploitation of colonies unto the first half of this century. The loggeded development obtaining in Asian and African former colories can be attributed almost entirely to the colonial rules. Hence, developed countries must shed part of completent stillinde towards environmental problems of developing countries. Instead, the fevelopes countries could decilitate the process of sound economic management of natural resources consistent with committee development and environmental goals of developing countries. (Suresing), Mohan, 1990) The developed countries exall provide concertional financial and technical angletimes that the devalories

countries need. They could also show leadership now, by trading off some growth for improved environmental quality and by pieceering the use of advanced technologies that will usher in the less material-intensive economics of the future. (Tunasingh , Mohan, 1990)

Options for Beveloping Countries:

content of environment and development are extremely limited. The pressing needs to raise stendard of living of ever increasing population can be satisfied only by producing more activaltural and manufactured goods. This puts pressures on the eco-balance and a process of neutralising the gains of material prosperity is initiated. In fact, with fast depletion, misuse and destruction of natural resource base coupled with increasing population requires developing countries to run like Alice in the Wonfer land in order to keep on the same place. It is increasingly becoming clear that the running has to be accelerated regularly to cope but to be accelerated regularly to ever increasing procesures.

Sustaibable development requires that only restricted explaitation of earth's natural resources is resorted to, such that in times to come withdrawals may be replemiabled. This will also necessitate prudent use of resource air, limited resources to be used sparingly, hereor resemble resources like wind power, color energy etc. to be harcessed fully.

The options available to developing countries in this content are both positive and negative. The nositive obtions relate to evolving an appropriate coliny of it decorates with the local needs and recorded availability. Adaption of now tochnologies in the past

tive public policy mix so as to put a price on the environment so that companies will have to pay when they pas environmental resources or when they pollute the environment. This will evolve a practice of appreciating environment and protecting the same.

This leads us to launch an exhaustive system of environmental accounting. The current national accounting systems do not capture the value of natural resources adequately and, therefore, development strategies, that rely on standard income accounting techniques may not result in sustainable development. Tational and environmental resources are not included in balance sheets. Convential national accounts fail to record the depreciation of natural capital, such as a nation's stock of water, soil, air, non-renewable resources and wild lands, which are essential for human existence. Clean up costs (e.g. expenditure incurred to restore environmental assets) are often included in national income, while environmental desages are not considered. (Lutz, Ernst and Kohan Munasingha, 1991)

One reason why the environment is abused is that its use is free. The eir; water, soil, trees and all other plants are usually there for everyone to use freely. We all know that environment is priceless, but it will only be appreciated and protected if a price is put on its use. That is endy not an easy assignment, but environmental accounting methods can and must be found. (Dasgupta P, and Marl Goran Maler, 1990)

Thus, it may be said that developing countries, even at lower level of development, have been facing environment 1 degradation. These countries require, a policy wix dor levelopment which is environment fracily.

was taptamount to more destruction of the environment.

New large scale infuntrial units, power penerating stations and the like virtually lad to aggravation of environmental defracation. The driving force in evolving new technology was increasing productivity of labour, whereas the pressure on natural resources was not considered at all or was relegated to secretary position.

The developing countries will have to evolve an appropriate trainology which is orvinocuental friendly' and cen be linked with socio-economic and cultural miliam of the country. The current' discount technologies in the industrialized nations should not be transfered to the developing countries, instead of improving nuttann there, they will cause nord acclegical damps, for in many cases there is no proper asimterance. So the need for a new generation of ecologically castrinable technologies exists would wide. (Simonia, Var E. and Errot U. Van Van Delcker, 1990)

evolved not only to protect the evolutionant but also to strengthen the same. It has been a great dailure story that destite tell claims, the mathe of deforestation to reafforestation still remain to be 19:1 would vide. Long developing countries have no except point of public policy the in developing countries must be to reverse the trend of environmental degreeation.

Provingutive voltey entions to ships nomination controlly restriction on the trace of community by well-circumstance of the control of the co

It is encential that appropriate technology is evolved in consonance with the availability of resources at local level. The developed countries must also come forward in halping developing countries to design new technology. The test way out for developing countries can be to resort to environmental accounting. This can belance development with environment. Once a system of environmental accounting is incorporated, it becomes easy to protect environment. By relating the costs of environment which must be beene by manufacturing units which use such resources, strong detarants may be imposed.

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Garhwal Himalaya: Environmental Degradation and Some Conservational measures.

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#### Abstract

terrain and includes a variety of environmental resources.

Depletion of these resources due to ill planned scheme can deprive the people of this region of most of its wealth in the name of preserving a small quantum. The present paper gives a wide range of distribution of various environmental resources and its degradation in the region, resulting situation has naturally roused concern of many people.

There is a need to make special allocations and call for new planning approach for the development of hill areas.

## Introduction

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segment of the Himalayan arc and in many ways it quite unique in its geographical and geological setting. Almost 50% of the world population depends upon mountain resources and are influenced by processes occuring within mountains. Approximately 10% of the world population live in mountain regions and about 40% are dependent in some way (Muller, 1974) on mountain resources viz., water, forest, agriculture, recreation and minerals. The Garhwal Himalaya (Lat. 29°25' to 31°28'N and long. 77°49' to 80°6'E) with a total area of

about 30,000 km<sup>2</sup>, is more backward. There is a considerable variety of mountain people with different culture, flors, fauna, landforms and geological structures. Water, soil, forests and tourism be the most part of Himalaya has become more and more severely depleted with the passage of time (Hillery, 1990). It is source region of India's holy rivers the Ganga and Yamuna. It is supremely rich in natural resources as well as cultural resources of ethnicity and folk traditions and super pilgrimage resorts as Kedar, Badri and Gango.

#### 1. Water Resources:

to be planted, keeping in view ontinum behefit to the affected polulation. Most of the major rivers of the Himslays have their origin in the Carnwal Himslays. Geological structure and land forms of this area are suitable for damping the rivers for power production and irrigation. Water power has been used to run water mills for gripding grains and hydel power. The catchment of all these river systems were thickly forested but repid destruction of these forests is very serious. There is an urgent need to put back the catchments of all rivers under cover of tree and fodder crops. In summer, scarcity of drinking water is regularly faced by many villages in the region. In some parts, to bring water they walk 2-3 Km. A number of river valley projects are under investigation (Saklani, 1980) in the Carnwal Misslays.

The Union Covernment's Hill Reservoir Scheme, which

development through systematic water baryasting in the micro watersheds. A large number of hot springs occur in the Garbara himalaya near Yamanctri in Uttarkashi and Badrinath and Papevan in Chamoli districts. The hot springs seem to have a good peothernal potential and work for the exploration and use of the geothernal chargy resources.

## 2. Forest and Grezing Land:

In the region the agriculturists maintain the large number of livestock and there is a need of grazing land which is increasing more presente on land. The records of the forest departments show 60-65% land under forest cover. The landstat imageries indicate that the forest cover in U.P. Himblaye is only on 28.7% land. Actual forests with more than 60%, crown cover are only on 4 4% land area. The rest 15% and 9.3% land areas are under moderate and poor forest cover, respectively. According to the figures of the forest department (F.R.I. Dehradun) who maximum area in the U.P. hills is under Oak forest (4036 Km²) followed by pine (3990  $\mathrm{Km}^2$ ) and Sal folest (1051  $\mathrm{Km}^2$ ). It is clear that the forest of this area are being utilized non-sustainable and if industrial desend will be parmitted to rise beyond the productive capacity of the forests, the future of forestbased industries will be in danger as well as future scope. for further expansion of such industries. This degradation of forest and forest land is one of the most significant factors in environmental destruction. A nomber of covironmental factors are responsible for trigging a series of avalanches, which is a natural phenomenon in the high hills... Denudation of the forest cover is further aggravating the problem.

The very first measure, to stop the spread of wasteland is to undertake an intensive plantation programme on such lands. To save and preserve the existing forest areas in an even more challenging task. Development of alternative sources of energy should be the first step towards saving present forests. Only those species should be planted which are native to the place and which also fulfil the day-to-day requirements of the people. Broad-leaved fooder trees, pelatable and nutritive grasses and leguminous fooder species should also be included under the plantation. Programme. (Singh & Saxens, 1989). Village ecosystem Plantage, i.e., integrated planning for the croplands, grazing land; forest lands, livestocks and water systems of a village can be attempted only at the village level, and by the villagers themselves.

# 3. Agriculture and Horticulture:

The agriculture and horticulture have heavily relied on the supply of leaf manure and dung of enimals. The narrow velleys and river terraces are naturally fertile.

They have the mainstay of the rural economy of the radion.

Pressure on lend is increasing so extensive tracts of hill slopes being put under the ploage and hoe. The fertile lend

is reducing, therefore we should be careful in maintaining the productivity of the land in hills. The catchment areas of reservoirs, aggravating the problems. Most of the holl slope cultivation is non-sustainable woich is responsible for defirestation and soil crosion. Production is quite low and people drive very inadequate subsistence from this activities. A large section of people of Carbeal Himalays have no alternative means of subsistence, except agriculture.

Subsistence wages must be given for the initial period of tree and fooder production to enable them to wait till drops mature and bring returns. There is a need of social forestry and integrated rural development etc. to take up this challenges. The crisis and solution of mountain farming cannot be understood by analysing economic and ecological variables only. Researches will also have to be reoccaniced. Modern solence and technology must build upon the social and ecological foundations of traditional knowledge, systems of landuse, water hervesting, cropping system and agro-forestry.

## 4. Soil Resources!

soil is the main natural resource of this mountainous region and supports indirectly the agricultural products.

Mere use of improved variety of seeds, suitable for plants with fertilizers, will not really help to secure an increase yield of crops in the region. The quality and type of soil depends mainly on the source rooms, slopes, climatic

conditions, processes responsible for the soil formation. The erosion of the Sarhwal Himalaya has greatly increased flooding in the Alakhanda, Mandakini. Shagirathi and Shilangana basins, one of the most densely populated and important food growing areas. In all zoomillion people are affected by what goes on the mountains (Lean, 1986).

The Central hoso Research Institute, India (CRRI) have proved that growing Vetiver grasses and bushes on the hill slopes can prevent landslides that have over the years claimed human lives and cattle heads besides damaging propetties along hill ranges. The vegetative system of soil and moisture conservation is dynamic, effective, low cost and the appropriate technology for farmers. Once planted the crop needs no further care or maintenance.

#### 5. Mineral Resources:

In all the belts or zones. The limestone and colomites of Laweri and Caunagarh immustion (Mobdi et al., 1972) in Dhanpur - Dobri area of Chamoli district contains dissemble nated deposits of couper ores. The dolomite belt streching between Kaproli and Manikhath near Dagar patti in Tehri district also contains, copper mineral deposits. Calena, an important ore or lead, is found spotadically as traces within gourtairs and Phyllites of Carbual group of rocks in Atalanana, Candanici, Dagar patti and Phyllites of Carbual group of rocks.

Pipelkoti & Audreprayer in Alaksanda valley. The high grade cream coloured limestone are found at along the Mussoorie hills. The important deposits of Phosphorite are located at Maldeota, Chamsari. Masrana, Pari-Tibe and Chaunpa-Kumeli, across the Ganga in the lensdowne bills. Most of the limestone and dolomite quarried are privately owned and it is in these mines that unscientific exploration and conagement is taking place. We must use the natural resources but with restriant and care and act as steward of nature to serve the best interests both present and future generations.

region may adversely affect the ecosystem of this region and may do untally harm to the nation. The leads must not be given in areas which are susceptible and pologically weak. They must be avoided in case of very steep slopes or in areas which are devoid of vegetational cover. Blasting if necessary during constructive work, must be used only in urgens cases but with minimum natural helards. Conservation measures for water chad memagement should also be brought in practice. Large scale afforestation and trult gardens should be encouraged in and around the localities where mining and quarrying is carried out.

# 6. Industrialisation:

Industrialisation is very backward in Carbwai Himeley's.

It is unfortunate that industries are concentrated in the developed area and rural people are left where it was poor.

Illiterate and exploited. There is a need of industrial

done. Parest resources have been responsible for the growth of forest-based industries in the region. But, little thought has gone into securing the long term resources base for eminting industries. So there has been a serious depletion of the forest stock which is adversely sitecting the industrial development as well as local people. The industries have exhausted the local resources and polluted the environment.

the extension of industry in this region should be based on physical and cultural environment. The future of Tourism industry is very bright in this region because Garrial Himsleys birds breatiful and dissistic scenic landscape with unique ecological and cultural excellences for thourism development. Most one like trakters are 3000 expeditions visit the Himsleys is a year (John, 1990). Every year from John to appear admitted a factorism trake in the Chambli district of Carneal Simpleys. Tourism is mainly based on pilgrimage. How, this rector is facing the problem reparting the development of tourism and danger created by modern tourism. Environmentally critical areas like Canpottl-Comakh should be declared wilderness area and entry should be regulated.

# 7. Socio-economic and foliciest Ornanizations

In the context of occasionation of the society of animal Disolary is calculable to consider the fertilepoint accordance. It is biexample as each frequents a secretary.

of interests and they are educated, have own land end power. The remaining society of shall land holders, Landless labour, nowed to end telbal acous numerically makes up the bulk of the society. There is a need of everyones in the society and much of the society. There is a need of everyones in the society and much of the society. The tradition of bookish learning is these weaker section. The tradition of bookish learning is of fural areas. There is a need of radical changes in research work, waking of decision, and projects work of this region for the process of scowneyslopment. We have adopted a Genodratic set up and nave attempted this at village.

part of Himeleys is a necessary prerequisite for the prosperity of the fill people and for the balance of maintenance of the ecosystem of Himeleys. These would call for indepth study of minerals. Forests, water and other resources. The original cosystem have already been degradation is increasing and spreading day-by-day rapidly. Therefore, it is essential that sarious attempt should be made to control the degradation of independing much activity in Carowal Himeleys.

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# ENVIRONMENTALLY SUSTAINABLE DEVELOPMENT PLANNING FOR THE HILLS (Case Study of Garhwal Himalaya)

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#### <u>Abstract</u>

That the planning in the villages is imposed from above from the state capitals and national capital is a cliche beaten hollow. But the stark reality present in the shape of gross poverty, haparard developmental programmes, and the continuity of Adam's day technical know-how suggests there is definitely a tragic flaw in our planning. The development of hill areas in the country received less systematic and some what halting attention during the first decade of Indian planning. The efforts were disjointed and generally did not result in any preceptible impact on the living conditions of the hill people. Billions of rupees are spent on the development of the Hilly area through hundreds And yet there is not even a single village, of agencies. which can claim to have achieved an economy even giving subsistence to each member of the families. So confused are the developmental agencies that dozens of them are working for the same goal, each of them is wond up every third year and a still new agency crops up in their place.

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#### Introduction

The present paper seeks to describe the hill areas of Garhwal Himalaya, the state of their environmental and governmental intervention in this area to promote planned and sustainable development through people's participation and to evaluate the needs of every village in the hills.

planners are additted to generalizing the needs of every village. A water-pipe line is given to Math village, near Peepal Koti (Chamoli) which has natural springs all around the village, afforestation is done on the high altitudes of Hariyali where there is already a very, thick forest. When the villagers ask for irrigation facility, the Block Development Office gives them an Adult Education Centre, or when they ask for a Panchayat Bhawan, they are given sanction for constructing briddle paths which they have in plenty. The problem is compounded by the colossal curruption practiced by the Government Officials and the Public. The reservoirs leak, forests perish, things never purchased only money charges hands, programmes are implemented only on the annual reports, and the villagers remain where they were. Though the things are supposed to operate at BDO level, getting any developmental project sanctioned one has to go to state capital to the big-wigs One can see scores of Pradhans in getting and developmental project sanctioned one has to go to state capital to the big-wigs there. One can see scores of Pradhans in state capital's secreteriat or a mission to get petty things sanctioned.

This has given birth to all pervasive resentment in the hills: sacessionism in Kashmir, Uttrakhand movement in U.P., students agitation in Assam, and the Underground Warfare in Nagaland and Manipur. Thousands of youngman are jobless in Uttrakhand, there is no one to redress public grievances immediately. There is no public participation in the developmental process. The result trouble is breqing high in the otherwise quite Himalayan slopes.

What has been grossly ignored in the proper survey, assessment, and analysis of local needs vis-a-vis the available local resources. The climatic, geomorphological, and ecological conditions of an area have never been the imputs of a official development model. Plans are erroneously drawn out for the entire hill region, as if the hills were a stretch of a flat land. The flat-rate budget allocation to each Panchayat on the ratio of the village population speaks volumes for the bankruptcy of the planning process. On the name of heavy investment motor roads are erected everywhere only to cart up the food grains, packed quick-foods, and packed dairy milk. The planners never think of what shall be sent back through the roads. Of course, the road, have become the easy medium for the youth to migrate to the cities.

This scenario of the planning process urgently calls for separate planning models for separate kinds of villages in the hills. For the purpose of a down-to-the-earth planning model, villages can be classified into the following three kinds of geomorphological units:

- (a) Villages at Spurs and Ridges: Situated at the ridges of the mountains, such villages from a distinct geographical unit. These are invariably set into thick forests. Agricultural land is a rarety here; the economy is based upon vegetal resources. Fresh patches of land were once reclaimed by clearing of the forest cover, but the practice has now stopped. Beans, potato, milets and fruits are the only agricultural yields. Rest of the living is eked out of the milk, wool, and forest products. Livestock economy is the essence of such economic structures. With the height, the pentheon of gods changes, and changes the structure of life style, settlements, water resources, topography, and house architecture.
- (b) Mid Slope Villages: Situated at the mid slope of mountains, these villages are facing the acutest environmental crisis. Forest cover has vanished, distance between human settlements and forest has multiplied to the extent of pilgrimage, water resources have become scanty, humus and fertility of the soil has reduced, and the available arable land is fast turning into waterlands for want of water and vegetal waste. The modern 'Money Order

Economy' and 'Saturday Economy' have made deep inroads into these villages.

The natural resources need regeneration the cultural and human resources are also shrinking fast.

(c) River-Valley Villages: All prosperous villages of the Himalayan region are situated in the river valleys. Even before the modern engineering came to Garhwal, these villages had their own indigenous system of irrigation. They supplied the maximum food grains to the region, and these still record maximum per hectare yields in the entire U.P. state.

Since irrigation is not adequate enough to the ratio of the land available some patches still remain unirrigated. The timber line has recorded far away from these villages. The villages are culturally rich, well connected with motor roads and are in a process of urbanisation. Agricultural cash crop and medicinal plants are the great hope in such villages.

Through Masterplans separately for each of the three categories of villages after an intensive survey and participating observation will have to be prepare. The master plan should be prepared on each aspect of life - social, economic, political, educational, health, environmental energy, cultural etc. A full master plan will not only give a solid base for development but will also bring out the reasons that have failed every governmental programme.

Through periodical camps and regular presence in the villages the planners should participate in joys and sorrows of the villagers, win their hearts, and feel what the villagers actually need and what, with the viable local resources end governmental resources, can be done.

For preparing the developmental models for the villages the educating youths, retired personnel women, and weaker sections of the society in the process in order to make them more responsible to their society and more sensible to what the purpose of education is.

The following should form the preliminary of the plan:

- 1. Intensive survey of resouces and needs
- 2. Implementation of some development programmes to give insight into developmental process and to create will for development
- 1. <u>Intensive Survey</u>: The survey will document the needs of the villagers, the resources, and the potentials of permutations and combinations in the present economic social, and cultural systems. The following will be surveyed:
  - 1. Forest Resources
  - 2. Land Resources
  - 3. Water Resources
  - 4. Human Resources

The following potentials will be surveyed :

- Land Reform : Consolidation of land holdings, reclaimation, and conservation.
- Modification in house structures, outlay, and use of alternative building material.
- 3. Reshuffling in crop pattern.
- 4. Experiments in crop species.
- 5. Improvement in animal species through DFS system and elimination of sterile breeds.
- 6. Experiment in tree species.
- 7. Possibility of alternative energy sources and microhydle projects.
- 8. Water harvesting through polythene taks, rain-water tanks and short distance channels.
- Possibility of environmental rituals and cultural integration.
- 10. Preparations of syllabus on non-formal education, useful in day-to-day and productive activities.
- 11. Use of available human resources for implementing developmental programmes.
- 2. Implementation: The master plan should be prepared through a trial and error method. It is strongly felt that unless we really start working and then start stumbling upon difficulties, the plans will become again unrealistic and will be deemed to fail. Through the participation of educating youth and the villagers the following programmes should be implemented.
- Environmental education through eco-camps and <u>van</u> mahotsavas.
- 2. DFS system to improve cattle breed.
- 3. Construction of RCC tanks and polythene tanks.

- 4. Production of vegetable and plantation of fruit trees.
- 5. Medical camps.
- Experiment with indigenous cold storages (without electricity).
- 7. Experiments with the non-formal education and motivational education to the students studying under deprived educational conditions.

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Introduction: Floods have occured, are occuring and will occur in future and thus it is primarily a natural phenomena, In different mythologies the description of 'deluge' is quite common, like in Old Testament the Mosh's Arc, in Indian Mythology the e went of 'Pralay', the concepts of 'Kurma' and Matsa' AVATARs are evidences of such phenomenal flood situations.

Flood is a product of geomorphic, hydrological, climatological and other environmental processes. It is natural, man never created it initially, might have aggrevated it later by creating new floodprone areas. The hazard perspective of floods is dependent on whether it affects human lives and property. The intervention in the ecological systems by man has caused several disturbances in the nature. Thus floods have become more and more complex, destructive character videned, new floodprone areas created and false sense of security developed. The results are more and more loss of life and property. Controlling and prevention of a natural flood is simply a wrong approach. It is justified if the root causes are identified and ecologically acceptable solutions are undertaken for the entire length of a floodprone river. Flood is not to be identified as a spatially discrete phenomenon. Therefore management approach in the catchment areas, floodplains, or in one word, the river as a totality should have to be incorporated. The best possible combination of approaches will naturally be river training - an ecological and technological input combination associated with human adjustments. The objective will however remain very specific, as to minimize the loss, because total ceassation of loss would be impossible.

Ploodplains are natural choice of human occupation and activities and evidences from history are well known. One of the

early settled, densely population, agriculturally rich and concreteally forward area of South Anka in the Indo-Cangotic Plain. It is a fleetprin ragion too, India receives an armed procipitation (raid and mass) of about 400 million hosters notres (Enen) er 4000 billion orbis moteos (bon). In eddition, rivers flowing in free orestates estential in the Winderson testerated bringing employer 20 biles or 200 top of vator. C? this 420 lines 70 Min overpraise immediately after it falls. The receiping 550 Maen gots converted into 169 Macs of soil moisture ( for raising forests, gracece and drylend erope), 135 Mich of service water in rivers, pends and tenks and 50 liber of ground water. Finally this 350 kinds gots transformed into 200 Khan of soistich which is lost to the atmosphere through overstranspization and another 150 Mice of water flows into the sea. There is a natural tendency within the country's organization to without unwest availability of water over the year. In entered forms floats enter during the four mongoon months and droughts in the remaining period. In a decadel scale ludin withersed the united digaster events (floods) in the following manner - 15 fleres is '60m, 22 in '70s and 27 in '80s, a gently looressing trend. The come troof is seen in the case of everage ancher of people affected and number of paople killed in floods. 70% of world's flood victing live in India (India and Bargladowh) as calculated for the pertod 1950 - 1981.

It is very intercesting to note that the floodprone eres in India is increasing in apply of technological inputs introduced. Central finencial assistance released to the states for environmental discators (floods, droughts and other natural calemities) is also increasing at a steady rate. The Mitigaal Flood Commission and optimized in 1973 that the floodprone areas had increased from about 25 million heaters at the end of 1960s to about 40 million heaters by the mid-1970s. In 1985 the flood prone area in the country had gone up to 59 million heaters an extraordinary increase in just mix years pince 1978, incording to the Commission, its methodology of calculating the floodprone area unimaximum underestimates it, and, so past experience goes, even those areas which are claimed to be protected from floods, can get flooded.

Therefore the fleedprone eres in the country today cust be around 65 million hectures. Enform 1970s states like Dihar Uttar Pradesh, Vest Bongol, Orieza and Assem Accounted for ever the 50% of the area offected by fleeds. In the 1970s new states like Andhra Fradesh, Machya Predesh, Maharastra, Tamilmadu, Rajusthamand Gujrat were also setting fleeded. In addition, new areas

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are getting flooded events in traditionally floodprone states like U.P., Diher and Cribes. Increasing population in the country and increasing landuse in one hand and increasing areas under flood on the other leading to a ponderable quanties reality more and more population facing flood hazard.

#### West Bengel - A Mappingroup State:

West Bengal is a naturelly floodprone state located at the extreme lower and of the Ganga system. The People's Republic of Bangladesh constitutes the sajor part of the delta system. The flood problem of West Bengal deserves special attention for it has got more complexity in its nature.

This region can be calleed the evacuation channel! for the whole of North India because of the large catchment area of the Ganga present. A major offshoot of the Gange, the Bhagirathi dissects the southern part of the state into two unequal west and east division. This north south Bhagirathi exis is joined by a large number of east and west flowing tributaries, the latter ones originating from the exposed, highly erodable, lateritic igneous plateau surface of southern Bibar. This reference is needed to indicate the quantum of sendy load brought down by these rivers. Given the sensonality of monsoon rainfall the sudden increase in water discharge through the sand missexed chaked channels lead to spillovers. However, the western parts of the channels show lesser area under floods because they are confined mainly within the floodplains sharply demarcated by the undulating topography. Along the Bhagirathi axis the main floodprone areas of the state are concentrated. The flood problem is more difficult to handle, atleast from technological point of view because of two specific ressons - (1) very small longitudinal gradient and (2) enormous volume of water (rainfall and surface flow). The north and south Bengal districts have distinctive differences regarding the causes of flood, but what is more important that the North Bengal sub-Himmleyan districts face flash floods and South Bengal districts annual floods and waterlogging. There is practically no district left in the State Percept Purulia where flood was not experienced during a spen of 17 years (1959-1975). The State contains two extremities - flood and drought prone areas. But hardly a combination of these two can be seen superimposed on each other over a geographical space. The district of Birbhum in West Bengal contains such a remity. The droughtprone and floodprone regions of the district lie side by side, as well as superimposed in certain parts.

# Birbhum Floods : An Overview

part of the State experienced four floods during the period 1961-1985. The eastern fringe of the district, which is a part of Bhagirathi floodplain has continuous stretches of flood affected areas, the frequency ranging between 1 - 4 floods during the given time span. The western side flood affected areas are mainly confined along the moderately graded and defined floodplains. The district experienced a cyclic order of one flood year in every four years commencing from 1963. The only exception being 1961 and 1963 - a gap of one year only. After 1973 upto 1976 Birbhum was not flooded and in 1978 when the devastating flood gripped the whole State Birbhum was not excluded. Thereafter 1984 was a major flood year for this district. The maximum number of floods (four) into that have occured in the same area was the floodplain of Ajay, the river comprising the southern boundary of the district

Out of the 14 police stations (F.S.) of the district 9 were flooded (64%), of which 45% P.S. were flooded once or twice and 21% more than twice during the 1959-75 period. Quite naturally the P.S. located in the extreme southern frings of the district had to face the flood hazard more in number than the other police stations of the district.

## Flood Addustment In Rural Settlements : A Casa Study

ment the floodplains of the Ajoy and the Kopai, two east flowing tributaries of the Ahagirathi, are sammaginame no exceptions. These two rivers are flowing over the southern half of Birbhum district. The Ajoy originating from the vicinity of Tribut hills near Deoghar in Bihar traverses the Chhotenagpur plateau to enter the district from west. The Kopai, a much smaller river, originates within the district from near its western boundary. These two rivers have areated a watershed which comprises the major part of a police station known as Bolpur with 170 villages and one urban centre - Bolpur town. The Kopai river traversed through the centre of the P.S. from west to east. The Ajoy follows the same direction but demarcates the southern boundary of the F.S. The objective of this case study is to find out how particularly the rural people, with more exposure to natural hezards, less personal

resources to combat against them and more dependant on nature; are interacting with floods. Long term as well as short term technological inputs are not unknown in this region, but the gestation pariod and continvolverent in auch messures are lone and missable enough. Therefore the case study is directed towards micro (villago) level precautionary and adjustment measures which will immediately benefit the people rather then institutional enterprize can do. This approach may be too simplistic and micro level solutions are not always acceptable because floods are not spatially discrete phenomena and there is an obvious necessity in identifying the problem at the meoro level. But the immediate question is - what the people will do during planning and execution period and the time lag involved till their benefits generated. Moreover there will be practically no guarantee that such measures will be absolutely foolproof. Of the three rural settlements calected for this purpose two are loosted in the Ajoy floodplain and one in the Kopai flood plais. The villages respectively are Pancheca (J.L.No 142). Resalpur (J.L. No. 147) and Goelpera (J.L.No. 65). Pancheon is about 1234 from Bolpur town with a population of 1563 as in 1985 eccupying an area of 752,87 cores, Resulpur is about 60c southeast of Bolour town having no direct communection with it and Goalpara is situated about 5km north of Bolpur town with an area of 359.49 serss. From 1961 to 1965 there were atleast four major floods in Kopai. Amual flood are very common and some times not recorded stall by official agencies. Since this survey in almost entirely based on primary data made available by the villagers following a questionnaire giving main thrust on the nature and degree of losses they had to face, naturally the phenomenal flood of 1978 and the flood of 1984 were the two flood years they could provide detailed information with. The 1978 flood is remembered for its magnitude and that of 1984 for its latent accurance.

In all these three villeges the built up areas are found to be safest ones, but the caste and economic status of the villegers naturally decide the location of respective homesteds. The south west part of Fanchece village remained remained completely defe from flood waters during the previous

Floads, this was because of its comparitively high gradient and being occupied by high and middle minux caste people, where do in morth east part clustered buts suffered almost every year even in sarginal flood occurences. For Goalpers the northern rivering part (agricultural use) suffers destruction almost every year during annual floods commonly taking place during and immediately after the measurem menths. The 1978 phenomenal flood kept 90% of the village totally under water for 19 days but during 1934, the last recried flood, demage occured 25% in 25% of the village territory. In Resulpur the most remembered flood is that of 1973. The location of the village itself explains why it is so. In 1984 there was no appreciable damage faced by the village.

The losses generated by floods may initially be divided into direct or immediate and indirect effects. Pollowing is the bring account of direct losses:

### (A) Land Affected (agricultural) :

Survey undertaken in Panchsca shows that the wealthy formers, who have small segment of the total population own the prime agricultural land with high fertility, in average 13% of their land were affected. This figure is negligible from the peint of the proportion of unaffected land and the losses from the affected lands too are negligible. On the other hand 33.33% to 45.79% of land belonging to the lower middle class families were affected by crosion. Damage of residential and utility houses show that the poorest people (not the Schedulan Caste or Tribe population - a point to note) were the worst sufferers. Their poverty had left no choice in selecting the location for their homesteds in comparatively safer sones.

In Goelpara not a single plot of land or hosested could escape the flood waters. The left bank of Kupai is relatively higher thus water spilled over the mest mask right bank and inundated the whole village. The damages in terms of agricultural land, crops, tattle heads and other properties were near total. Huge volumes of sand were deposited over agricultural lands thus converting them into simi-personent fallow land. Recovery from such conditions require money and labour affordable only to the small number of moneyed land owners, thus the plight of medium and small farmers can easily be imagined.

In Resulpur village, mettled primarily by muslim population belonging to different economic strate, the loss of agricultured lend chared 674 samps for wealthy farmers, 61% for small fermers (owning 3 - 10 bighas of lend). For the low casts Mindus and tribal population the demage was near total (\$ 90%).

#### (D) Loos of Crops :

In Panchace and Goalpara 42 households lost crops from 100 bighas of land emounting to 101900g valued m146600 as per the then price index. Crops include peddy, sugarcane, potatoes and musterd: In Reculpur 45 households coming less than 10 bighas of land lost paddy from 80 bighas (32000 kg) valued at m48000 and sugarcane from 80 bighas (200kg melasses) valued m5600. 35 house holds belonging to 10-25 bighas land holding class lost paddy from 160 bighas (64,000Kgs.) valued m96,000 and sugarcane from 12 bighas (3000kg mellasses) valued m8900. Finally, 15 households coming 25 bighas or more (par household) lost paddy from 190 bighas (76000kg) valued m110000, sugarcane from 22 bighas (5500kg mellasses) valued m15400, potatoes from 7 bighas (1400kg) valued m 1400 and mustard from 6 bighas (1200kg) valued m12,000.

The pattern of direct leases show that (1) the number of crops affacted in Panchaca and Goalpara were more, and less in Resulpur, (2) higher landholding classes in Panchaca and Goalpara accepted seem loss for more number of crops than the low land holding classes, but Racelpur was more uniform in this regard.

(3) Paddy being the most important crop in all the three villages the volume of less of paddy was naturally maximum. Apparently there was no such differences found in the extent of crop damage in these two spatially different floodplains, but the average of paddy less was more Rasulpur than in the other two villages. For Goalpara there is no explanation for this, whereas for Panchaca the 4.5Km liner distance from the Ajoy might have negated the fury of flood to some extent and in case of Rasulpur the immediate vicinity of the river (Ajoy) did play havee.

## Tuilrect Losses - (A) Post-flood Discuses :

Cases of disease emption were observed, but rather and pullicantly an all the three villages. Malerial attack took two lives in Goslpera. This disease is common in the post mongon period thus cannot be associated with floods directly. Rasulpur most special mention from a different stand point. A general awareness helped the villagers to take preventive measures not only for

themselves but also for the bovine population. They were cautious about drinking water and ispended on a reliable source. According to the villagers the loss of some bovine population was due to nonevailability of propper Sector in the past flood period and lack of institutional help to immunication cattle prior to floods.

(B) Post Attack in Standing Group &

No spatial difference in two floodplains could be identified in this regard. The arm of paddy was the worst affected one followed by potatoes. For puddy, the NTV, costly and affordable only by monoyed ferrors, have a natural higher resistance agaist such discases. Thus the small and modium farmers were more affected. Even the agricultural errors located in higher tracts and remained from direct flood waters showed this tendency. Therefore the agaitude and spatial expansion of flood water do not seem to have enough influence in this regard.

- (C) Effects on Prices of Land, Besd, Crops etc.:

  Specific informations were difficult to be obtained from the villagers, but Resulpur repidents informed that at least six marginal land owners prefered to become landless labour rather than keeping their floodprose plots which they considered more a liability than asset. The buyers were naturally the local wealthy fermers, and their stakes gare land at a bargain price. If total loss to be incurred in those plots in a flood year that would marginally affect their total resume, and in page of a flood free year the productivity of those plots would be above normal.
- (D) Changes in the Rural Compational Structure:

  A considerable outsignation purticularly of landless and agricultural labourers took place is madiately after the floods to Bolpur town and other flood free villages in the surroundings.

  Compare and Panchase experienced such tendencies than Rasulpur. This was primarily due to proximity to Bolpur town and presence of direct communication facilities. Excever, the villagers disclosed that such change in the village compational structure was rather temporary and cotumned to communication facilities compational structure was rether temporary and cotumned to communication latest by the winter crop season.

# Buren Adductmenta : The Emergance

Some interesting observations have been obtained from these three villages in the form of edjustments at the gress root level.

In Resulpur the following adjustments have been found:

(a) More introduction of winter crops. Water demand of such crups is being fulfilled by shallow tubewells (owned and ranted) and pumping water from Ajoy (hired pumps). Riverine plots are more used for HIV paddy and harvested before flood season,

- (b) Change in tropping pattern :- Hearly 30% of fertile land are deeply send covered and thus not suitable for crop oulture practised earlier. These areas are being used for growing melons, water melons and other appropriate crops leading to a change in the cropping pattern. But 20% land is yet to be recovered. (c) Change in residential structures :- Reising the plinth of houses was seen (those who could afford it). But more remarkable is that come villagers have built a new locality memed New Resulour in a batter location. This location escaped flood waters both in 1978 and 1934. In the old location 80% of the houses were partly or totally damaged. Two storeyed stuctures (owned mainly by wealthy muslima) have been arected with stable foundations. and selfcontained first floor with provisions for stock of food, weeds, valuables and other essential commodities. The forst floor have been made spaceous enough not only for family members but also for cattle heads in case of emergencies. Poorer people prefered (rather compelled to go for) houses requiring lowest possible escurt of money. They opined that, first, they can not afford building effective but costly structures, secondly, rebull ding cost of their present structures would be low in case of flood damage.
- (d) Emergency measures :- People do not have any idea about any emergency measures in case of floods.
- (e) Institutional measures for protection i- An embenkment is aligned along the Ajoy designed on the basis of 1956 flood discharge capacity with a height of 132.49 ft. R.L., 5ft above the extreme danger level. This, according to technical personnel, is capable of containing normal flood discharge. However, some of the villagers do not agree to this from their practical experience. Moreover, the villagers do not seem to have a false sense of security.

## Flood as an Environmental Phenomenon : The Role of Man

Although it is needless to emphasize that floods primarily are natural, but presently there are scores of evidences where human interference in the environmental system

loading to a mestro prvironmental degradation. Constructing canala, dama, voirs ato., and to bop it all, negligible or faulty catchment area end break menagement measures are almply accelerating the degradation process, the estolment area of the Ajoy principally lies whith the Chintenapur plateau in south Bihar. This area is undulating in nature with highly fractured igneous astemorphosed rook structure. The top soil cover is composed of mettled lateratic elements wired with sand said lime. The line does act as constitu element to some extent but it is available + 6 metres below surface level. Thus the tops soil cover is composed of highly erodable modular lateritic elepents which are easily removed by sheet west and susceptible to gullying ection. The negligible semi-rerephytic natural vegetation plays an insignificant role against such borizontal movement of potential load to the stream channels originating from this area. Overgrazing by domestic cattlehouds and fusiwood collection by local people are the two human reasons for such mass denudation process. Primitive and faulty agricultural activity practised by the local tribal population does not allow their subsistance accommy to be uplifted, but at the asse time ampli-Tying the degrating character of soil. Previously the Ajoy was a navigable river, now it has become muribued. This change should have been natural; but no doubt it has been accelerated by human interference and negligance. Cheking of channels therefore is quite common and as is lateral erosion and spill over of water. The question is that the settlements located along the length of the rivers are coales within the natural extension of river regime degredation. The exposure therefore is not unexpected and people living in floodplains remain conscious shout the possible hazards. Any protection passure may thus create a false sense of security and completeney. Talk may result into some decase due to physical and psychologycal unavariance. But unchilenged exposure to a natural hazard must usver happen to modern civilized man equipped with tenunciesy as his wangen. Man has of late realized that challenge to the environment would come back as a boomerang and the very existance of mentind would be undangered. Thus at a balanced approach towards delerstanting a river regime with all its positive and negotive attributes slong with technological imputs would be the best possible combination for a balanced existance of nature and man.

# Protection from Floods : In Search of an Alternative Approach

As it is seen in the two floodplains of Ajoy and Kopai the three flood affected villages reacted similarly as well as differently to the floods. The reasons are not necessarily environmental but this difference is to some extent dependent on economy zers and socio-cultural backbround. The proximity of Comlpara and Panchace to Bolpur town has created a negative attitude among the people. They are more dependent on Bolour town for relief and other rehabilitation pessures rather than attempting any measure on their own. Resulpur is far off and physically dissiciated from the Bolpur town, thus a psychological independent character smong the people may be a reason for more practical village level measures minuted being adopted there. Keeping in view of the constraints generating from technology, econogy, institutional systems and other inherent problems of the devaloring countries the environmental protection associated with protection of human activity have to be initiated at the grass root level Thus the possible realistic suggestions are to be decided in conformity to this balance. Considering the cases of the three villages the following practical suggestions are chalked out :

- 1. In Rasulpur the offtake channel of the Ajoy, locally known as 'Kana Ajoy' (blind Ajoy) should be utilized as a drainage out let for the village rather than a backflow channel of dlood waters, as it is now. This can effectively done by the villagers themselves by blocking/opening the contact points with the Ajoy in appropriate time. This channel may also be very effectively used for storing surplus water for irrigating agricultural fields during water deficit seasons.
- 2. A meticulous assessment of the soil condition may be done by the villagers in order to decide what alternative and economically paying crops/vegetables can be introduced in a larger scale. As refered earlier it is already in partial practice in the village. To achieve it more effectively the agriculture experts at the Block level may provide the villagers a more detailed blue print.

  Secondly, emphasis on winter crops (during flood free season) may be done with the help of available irrigation facilities, which may be enhanced if 'Hans Ajoy' is used as a storage reservoir of water, However, in both the cases the crops are to be selected in such a manner that they are both acceptable in the ecosystem and pricewise they are acceptable substitutes for the farmer economically.

pation creates a major accio-sconomic problem. The land of the fermers belonging to the lowest strate in the village economy when covered by thick layers of send beyond recovery physically and economically lead to displace the fermer completely out of his occupation permanently. The villagers may explore the possibility of finding alternative opportunities within the village for those people. For example, can pand be considered as a raw material for brick making or simply as a commodity to be sold?

For Goelpera and Panchaoa the following adjustment measures are suggested:

- The necessity to convince the people, particularly of Coelpara, about their own enterprize seems to be the most important issue The attitude of accepting the loss seems to have embeded in their mind. The University of Visva Bherati at Santiniketan may provide a meaningful support to them rather than just providing them with material for relief only. The role of local social and political workers may also be of great importance.
- 2. Change in cropping pattern and introduction of HYV may be explored both by the villagers as well as experts of verious disciplines. Winter crops may be introduced more widely as an alternative particularly in the floodprone spots.
- 3. To check erosion villagers themselves can plant special kind of mprimes seplings distributed free of cost by the forest department. This will to some extent check the physical loss of land as well as act as barrier against sand invasion. This may be applicable to all three villages.

The above suggestions may not be exclusive ones but sime at the adjustment seasures against a natural hazard. The suggestions are being generated endogenously. It would therefore be the job of a planner to formulate such kind of suggestions for different flood prome areas and add necessary technical inputs from physico-hydrological points. In attempting so there may be several constraints like financial, technical and institutional arrangements. Secondly, for obvious reasons the urban areas are more protected. The value of land and property, density of population etc. are higher in urban areas than in rural areas, and by virtue of being an urban area it will naturally draw more attention and generate publicity. This attitude area.

but socially unjustifiable. This affuntion is prevalent all over the world, may be with a different scale. Perticularly in a third world country the difference in every respect between the rural and urban areas are quite glaring, time it is not unusual that the rural areas are less important, if not neglected, than the urban areas. Given this accio-economic and institutional system our aim is to focus how the rurel people our help themselves in case of a natural hazard, the floods, Aural poverty becomes work acute, pour becomes pourer, herman becomes more dependent on urban areas and a series of chain reactions generate. The case studies of this paper thus provide as initial focus that action seainst a natural hazard is possible without an enormous financial, technical or institutional support. The actions may be in conformity with with the ecological balance and their economic viability sound enough to protect the people affected. Flood is natural, it will remain natural if we donot exaggerate it physically. Therefore, ways to live with it in one hand and meticulous choice of technological as well as cost effective measures are to be combined without disturbing the environmental system, on the other should be the right choice for the rural floodprone aress of India.

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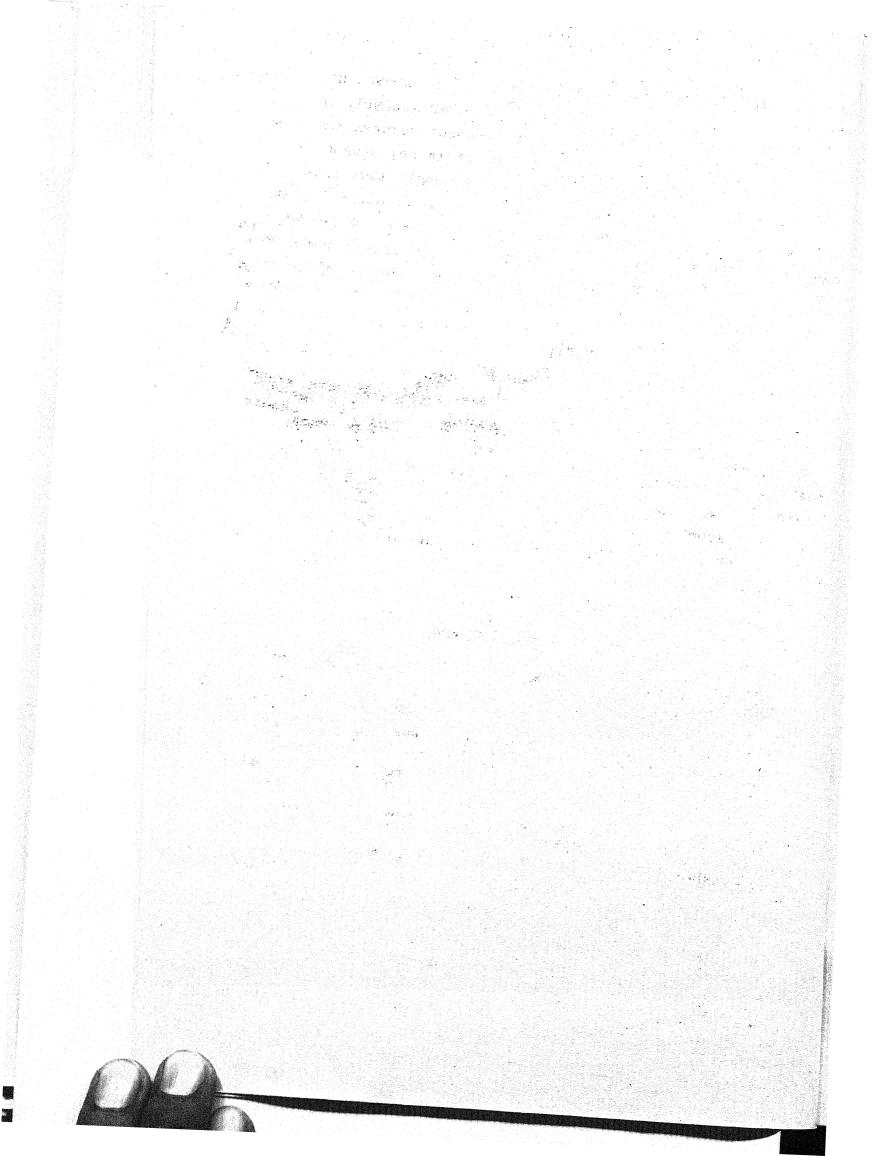
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# FIGHTING THE FURY OF NATURAL DISASTERS: THEIR ECONOMIC AND SOCIAL IMPACTS

N. BALASUBRAMANIAN\*

#### INTRODUCTION

Natual disasters have been disrupting the development processes ever since the dawn of civilisation. Mankind has been suffering from one kind or other forms of natural disasters like Earthquakes, Volcanic Eruptions, Floods Harricanes and Mud-These account for the loss of tens of thousands of human Flows. lives and properties worth billions of dollars. It is in this context, the present decade (1990s) has been called as the "United Nations" International Decade for Natural Disaster Prevention". There have been significant developments in scientific progress towards controlling or containing the ma tural disasters' effects on humanity. The objectives of the present exercise are to briefly analyse (i) the socio-economic impacts of natural disasters occurred in the last two decades, (ii) Preventive, planning and rehabilitation measures adopted so far and (iii) a need for further improvements to control or contain the disaster effects on humanity.

# OCCURENCE AND AREAS OF CONCENTRATION

The countries which are frequently afflicted by natural disasters to a large extend are Bolivia, Chile, Colombia,

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Ecuador and Peru in South America, Nicaragua in Central America, the Caribbean region, Burma and Philippines in South East Asia, Afganistan, India and Pakistan in South Asia. In these countries, Natural disasters are an yearly phenomenon.

As the plate boundaries are held responsible for development of geological and physical features of the earth these zones are also seismically active. Most of the earthquakes, as a matter of fact, originate within a few well-defined physiographic zones. They are the circum Pacific Island are french zone, the mediterranian volcanic zone, the Alpine-Himalayan-Burmese Fold Mountain Zone, the Volcanic mountain belt of central America - Andes and along the global mid-oceanic ridges with their extension along the Red-Sea-Dead Sea Coasts including the African rift valleys. Besides, zones of transform falnts perpendicular to the mid-oceanic ridges with their continental extensions are among the important states of shallow Foci earthquake. These include the highly active San Andrean Fault, the Owen-Murry-Quetta-Chaman Fractures of Indian subcontinent. Shan Fault of Burma and the medina trench Fault of the Mediterranian.

The annual North-South displacement of the Inter-Tropical Convergence Zone over the continent causes Frequent Flooding in Central America and the Northern Part of South America. On the other hand, the presence of the "Ring of Fire" along the Pacific Coast of the continent, together with other lines of contact between techtonic plates causes frequent and intense earthquakes and volcanic eruptions in the region. Natural



phenomena of metrological and geological origin frequently cause disaster of varying intensity in the countries of Latin America and the Carribbean. On the one hand, tropical storms traverse the Carribbean every year, similar events affects the countries located in the tropical belt of the Pacific Ocean Coast.

Major modification in the atmospheric circulation over the Pacific bring about changes in the sea-water characteristics of South America and floods and drought on the Pacific slope of the continent. This is also called as the "Elnino Southern Oscillation Phenomenon".

#### ECONOMIC AND SOCIAL IMPACTS

The natural disasters result in large scale destruction of human lives and property as well and bring untold misery to the escaped population. Moreover, they completely damage or disrupt the essential services, social and economic infrastructure. Furthermore, these direct and indirect losses lead to secondary effects on macro-economic variables and also severely alter the development policies and approaches of the governments. There has been no attempts to provide an account of quantitative estimates on a systematic basis of losses caused due to disasters. However, with the recent development of science in the field of sattelites and remote sensing, it has become possible to provide an extensive live coverage of the human sufferings and destruction brought about by recent natural disasters.

It needs mention here that the "United Nations" Economic Commission (ECLAC) for Latin American and the Carribbean" has done a commendable and pioneering work in estimating the losses

Table: 1 Natural Disasters occurred during the period 1972-1991

No.	Year	Location	Type of natural sissites	Leathe	In jured		Left unesployed	Property Loss
1.	1972	Hanagoa - Nicaraosaa	Earthquake	6,00	20, W	300,000	.0,000	\$2000 sillion
7.	197	Central Addrice	Murricana - Typi	7,000	N.A.	H.A.	N.A.	1600 million
¥ 14 <sup>7</sup> 7	1976	Colon Marth Garage	Carthonacko	23,000	76, <b>0</b> 00	, million	i N.A.	1.300 aultion
4.	1779	Demonican Apparent (Harki, Cubs)	Murricane David a Frederick	2,000		690,000		\$1000 million
5.		Rollvte, Chile, Ecuador, Peru	Elmanor phenogenon,		A.	N. A.	N.A.	<b></b>
Ġ,	1985	Mexico	Earth wake	10,000	30, <b>00</b> 0	1.5 51 <b>11</b> 100	N.A.	M. A.
7.	1785	Colombia	Volconso Emption & Mad-Flows	23, 900	5,200	10,000	200,000	N.A.
8.	1988	San Salvador	Ear tiquale	1,200	10,000	500,000	N.A.	N.A.
₹.	1987	Esuador	Earthquake	N.A.	N.A.	N.A.	N.A.	N.A.
10.	1988	Nicar <b>ag</b> ua <b>&amp; C</b> aribbean	Earthquake	N. ii.	N. i.	N.A.	N. A.	N.A.
ii.	1788	Sihar - Nepa Region	Earthquake	2, ( ×)	10,000	No ite	<b>11.</b> 6.	N.A.
12.	179) (Janu	Pakisten-Algeansetan lary)	Ear thquare	1,300	H.A.	N.A.	N.A.	N.A.

Source: Roberto Jovel, J. (1990), "Natural Diseaters and their Economic and Social Impact" in Cepa: Review No.38, pp.133-145.

caused by earthquakes and such other natural disasters there. The ECLAC has done a systematic assessment of (a) direct and indirect effects of disasters, (b) its effect on national socio-economic development processes, (c) identifying rehabilitation and reconstruction projects.

Thus, the effects of natural disasters can be classifed into the following:

#### **ECONOMIC**

- (a) The direct effects on the human lives
- (b) The direct effect on the property losses
- (c) Direct effect on the productivity levels
- (d) Secondary effects (which appears after some time) resulting in decrease in economic growth and development, inflation rate, balance of payment problems, deficits etc.

#### SOCIAL

- (a) Direct effect on social infrastructure like water supply, sewerage, electricity, tele-communication etc.
- (b) Break-out of epidemics and spread of diseases on the affected population and increased morbidity trends.
- (c) Damage done to commercial and public administration buildings, roads, railways etc.,
- (d) effects on housing (shortage), umemployment, (reduction) in public health services etc.,

It has been observed that five years followed by a disaster showed a decline in the growth rate of GDP, increase in fiscal deficits, increased imports for reconstruction and balance of payment problems. On the other hand, population

affected by natural disasters started moving (migrating) unter absence of health and education services, insufficiency of food, ducline in nutritional level, increased morbidity levels etc., For example, in Mexico, the disaster (earthquake) in 1985 occurred at a time when the government was applying an austerity measures in public expenditure, when banks were short of liquidity to face the increased demand for credit, and when external restriction were looming. In Nicaragua, the Hurricane in 1988 occurred when the country was not at all in a position to bear the shock. It was a difficult task for the government to undertake the necessary rehabilitation and reconstruction work on its own while at the same time continuing its long term efforts to achieve sustained development and to improve the living conditions of the population. It had to postpone its major economic and social development programmes which were underway or about to be initiated.

#### THE INDIAN EXPERIENCE

Natural criamities were a yearly phenomenon in India. The loss from floods alone amounted to over Rs.800 crores every year. However, in the recent years there have been sincere efforts in evolving a suitable scientific methods to forecast natural calamities, avert the crisis if possible or atleast forewarn the people in advance. The scientific achievements made in the last 10-15 years needs worth mentioning here. The Council of Scientific and Industrial Research (CSIR) have developed a system called "Very Long Baseline Interferometry (VLBI)" with antennae in different continents and, thus, have

Technology leaps during the last few years have been imparting greater accuracy to the prediction of not merely earthquakes but also other natural disasters like cyclones and floods. The cyclone warning stations set-up in the coastal areas of the country have helped in evacuating the people well in advance and also in planning for rehabilitation measures.

earthquakes. However, the 78th Science Congress hold at Nagpur in January 1991 suggested that there is no conclusive proof to indicate that large reservoirs created by dams induced earthquakes. It is said that a detailed deasurements and investigations be carried out to prove the relationship between earthquakes and dams. The Science Congress has also suggested that with setting up of a nationwide computer communication network (NICNET) and the establishment of earth stations and computers in all districts and states, a "Natural Calamities Relief Management System (NCRMS)", could be developed.

According to the studies conducted by the Water Resources
Division of the National Remote Sensing Agency (NRSA) in
Hyderabad, large scale aerial photographs and high resolution
satellite data could monitor land slides and map potential
landslide zones. The giving of timely warning about such
landslide will require extensive ground instrumentation for
measuring terrestrial movements. Satellite data can be used
for ampping and monitoring areas inundated by floods earlier
and making damage assessments. Real time flood mapping was

carried out in 1986 and 1987 when large part of the country sprawling from floods (Andhra Pradesh-Godawari, Uttar Pradesh & Bihar - Ganga-Kosi). The data collected will be of use in future years too. The heavy cloud covers put some limitations in these assessments. However, the NRSA studies reveal that these limitations due to south-west monsoon clouds could be overcome with the help of microwave instruments with argmented capabilities for all weather operation.

#### SUGGESTED MEASURES FOR POLICY IMPLEMENTATION

while the mankind has no control over the location in time and space— and the intensity of natural disasters, it is possible to take effective measures to bring down their social and economic effects to more manageable levels and thus contribute to long—term development. It needs mention here that Japan is one of the most earthquake—prone countries in the world, however, Japanese have managed to escape from the destruction due to their planning and preventive measures. Hence, it is argued that other disaster prone countries can try to follow the Japanese pattern of planning measures in reducing the effects. A detailed study on the controlling and warning systems evolved in Japan could be incorporated in the planning practices of other countries also.

Disaster prevention measures are framed in order to prevent or atleast to limit their destructive effects. They include forecasting and warning based on proper scientific studies. Setting up of networks to monitor the development and evolution of meterological events and implementation of Early Warning systems.

- \* Legislative measures and technique, zoaning laws based on vulnerability analysis and special building codes, to ensure that buildings are able to withstand the anticipated effects of natural phenomena.
- \* Physical planning laws and regulation of regional location of settlements etc. should be taken into consideration by sanctioning authorities.
- \* "Disaster Consortiums" (suggested by the 78th Science Congress, 1991) should be established at the regional and local organisations as well as the local community.
- \* The education and training of population to make them aware of disaster risk etc.
- \* There should be a well-defined national disaster reduction policy relevant to respective country's situation.

#### CONCLUSION

Given their high costs in social and economic spheres and the frequency with which they occur throughout the world, natural disasters should be recognised as development problems rather than as isolated events. Preventive measures, planning and rehabilitation measures should be included in long term development plans. There should be a special fund, created either by instroducing special levy on the better off section of the population or diverting part of the already existing levies to provide for a "disaster reduction fund". There should be every effort to combat the fury of the disasters and the countries frequently affected by natural catamities should do all possible efforts in order to fulfill the objectives of the

present "United Nations" International Decade for Natural Disaster Reduction".

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# THE IMPACT OF ENVIRONMENT OF CRIME

## A CASE STUDY OF THEFT CASES IN METROPOLITAN HYDERABAD.

A. Lalitha Kumari

INTRODUCTION: The problem of crime is not new in any society, however, the definition of crime varies from country to country, because laws to define crime vary between and within the nation. Crime is being experienced by both developing and developed countries but at different levels. And it is rather difficult to bive a permanent and universal definition of crime. So in a broad sence crime can be defined as the violation of rules and regulations which are enforced by the state and the society. Crime is regarded as any social harm defined and punishable by law (resking).

The essential channel channel crime is that it is couldnot be sential channel chan

react atleast as a last resort, by punishment. The two two creiteria generally regarded by legal scholars as necessary element in definition of crime are legal description of an act as socially harmful and legal provision of a penality for the act (Sunderland.)

According to the dictionary crime in "an act punishable by law as being forbidden by statute".

Criminology is a scientific study of crime. It is mainly concerned with the causation i.e. what produce crime and the criminal. It has become the main area of study of the sociologists. Anthopologists, Phychologists and Geographers. Recent research in the field of Geography of crime has selected location. space and territory as its centre of study. Environmental criminology has emerged as a result of this new locus of research.

"Any crime comprises the four dimensions of the law the offenders, the targest and the place, although they stress that all four of these have ultimately to be that at integrated. It is their contention that environmental criminology is the study of place which is the fourth dimention of crime, the Bratinghams define place as the discreate location in time and space at which the other three dimensions intersect and a criminal event occurs" (Bratingham and Bratingham 1981).

Environmental criminology is a new approach where the impact of location territory was and environment upon the patterns of crime events are studied. It pays attention to the special distribution of crimes in terms of degree of vulnerability of the areas.

PRESENT STUDY: Metropolition Hyderabad, the capital city of Andhra Pradesh is the 6th largest city of India. It compares the twin cities of Hyderabad and Secunderabad, like any other large and rapidly growing city it is also witnessing criminal activities, of various kinds these include crimes against persons like murder, homocide, forcible rape, aggravated assult, and property crimes like theft, burglary etc. There is however a variation in the rates of crime in each of the parts of the city depending upon the availability of the materials, ease of access, case of disposal etc. Thus some areas seem more vulnerable to crime than others. The present study is an enquiry into the theftcases that have taken place in Metropolitan

Hyderabad (1989). An attempt has been made to measure the vulnerability of different parts of the city to theft by computing the crime rate. It is also sought to study the impact of location and socio-economic milion, which are strong envisconmental influences on the illustrations of crime. Cross-sectional variations in rates among different social and economic groups of people are also intended to be studied.

The study also seeks to probe the distance crime relation in a core periphery context was within the city of Hyderabad.

A sample of 5% in taken on the basis of stratified areal random sampling. The information needed fof the study was extracted from the police interrogation reports of thefts in the crime Branch of Hyderabad.

The study proceeds on the basis of the following Hypothesis.

- 1. The busy commercial centers are more vulnerable to crimes. Crimes are illustered in the central Business districts (CBD), Abids in North Hyderabad, Charminar in South Hyderabad and M.G.Road in the Secunderabad, division of Metropolitan Hyderabad.
- 2. Crime is more in the core of the city and decreases with distance towards the periphery i.e. crime and distance are inversely correlated.

3. The crime is committed most after by those from the lower economic strata.

# DISTRIBUTION OF CRIME IN THE METROPOLITAN HYDERABAD CITY.

Crime is an illegal activity where a victim and an offender as involved. Most crime is economically motivated i.e. the objective of amountating crime is to acquire property to enhance the standard of living of the offender. Thus property crimes are purely economically motivated. It is assumed that in general the crimes against property are reactions to local opportunities and deprivation and the offenders are attracted towards general areas with or without any specific planning.

TABLE-1
HYDERABAD CITY
CATEGORY OF THEFTS - 1989.

S.No.	Category of thefts	Sub-Category of thefts.	No. of thefts	% of thefts
1.	General theft	2 Pick-pocketing	17	14%
		3. Cycle theft	16	14%
		3 Motor vehicle "	2	2%
		🌲 snatching	5	4%
		5 other thefts	47	40%
			87	73.7
2.	Theft from the house	House theft	9	8
	nouse	House breaking	6	5.6
		Cat <b>tle th</b> e <b>£</b> t	1	.8
			16	<b>13.</b> 6
			**********	MAD COM TON THE

3. Theft by a servent	Servant theft	3	2
	chesting	2	2
		times 1876 vers Glate Males Sing Sing Sing Sing	**************************************
4. Miscellaneous (preventive arrest)	P.A	10	E # T
	Total:	118	100

Source: Interrogation Reports - 1989 Crime Branch - Hyderabad.

Table - 1 % shows the category of thefts. The major category of thefts in general theft which take place at general locations like parking places, bus stops, railway stations, theaters etc. and includes, snatching, pick-pocketing, cycle thefts, motor vehicle thefts and other thefts. All these together make up 73.7% of , the toal thefts. Of the sub-categories "Other thefts" account for 40% which is the highest. This is followed by pack-pocketing which accounts for 17% cycle theft 16% snatching 5% and Motor vehicle theft 2%. The next category is " thefts from the house" i.e. the target places of the offenders are houses. They account for 13.6%. The sub-categories are House theft, . House breaking and cattle theft account for 8%, 5.6% and 0.8% respectively. Theft by a servant accounts for about4.2%. The sub-categories of this class are servant theft and cheating which account for 2% each and 10 individuals were arrested as a preventive measures.

It is obvious from the above table that the number of arrestes decrease as the area of opportunity decreases. In the case of theft from the house, the area is limited and the operation is risky. In the case of thefts from general places the area of poeration is vast and chances of escape greater.

T A B L E -2 HYDERABAD CITY: DISTRIBUTION OF THEFT RATE-1989.

Ward No.	Population	Crime	Councy bor 100000 Pg
	177299	87	4 9%
2.	87 <b>67</b> 7	72	82%
	89203	80	89.70
4.	41911	61	145.5%
	73781	178	241.3%
6.1. 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	69806	73	104.6%
	<b>5290</b> 5	60	113,4%
	82784	64	77.3%
	54850	28	51.0%
.0.	63646	117	183.8%
<b>11.</b>	57490	100	173.9%
· <b>2.</b>	57492	35	60,9%
13,	1108 <b>97</b>	61	<b>55.</b> 0%
14.	69848	142	203.3%
15.	<b>38</b> 258	132	345 %
	134644	140	104%
7.	129067	94	72.8%
18.	110002	81	73.6%
9.	64338	93	144.5%
0.	75798	30	39.6%
1.	49317	76	154.1%
2.	59 <b>215</b>	50	84.4%

I       38073       31       81.4%         II       34797 (II,V,VIII) 40       115.3%         III       15588 (III, NV) 97       622.3%         IV       103622 (VI,1X,XI) 78       75.3%         V       16032 (VII) 71       442.9%         VI       36530 (X) 23       63%         VII       90491 (XII) 102       112.7%	23.	64702	24	37.1%
III     15588 (III, IV)     97     622.3%       IV     103622 (VI,1X,XI)     78     75.3%       V     16032 (VII)     71     442.9%       VI     36530 (X)     23     63%		38073	31	81.4%
IV     103622 (VI,1X,XI)     78     75.3%       V     16032 (VII)     71     442.9%       VI     36530 (X)     23     63%	II	34797 (11,v,V111)	40	115.3%
V     16032 (VII)     71     442.9%       VI     36530 (X)     23     63%	III	15 98 (III, AV)	97	622.3%
VI 36530 (X) 23 63%	IV	103622 (VI,1X,XI)	78	75.3%
시마스에 보다고 하하네 보이라면 보이지 않는 하이라면 모모 보다고 있다.	•	16032 (VII)	71	442.9%
VII 90491 (XII) 102 112.7%	VI	36530 (x)	23	63%
	VII	90491 (XII)	102	112.7%
	Enhantementoria, prominingajnjungabengajnentrom contentas	angel an ina panagagan na san ah na naman dhan na na na pangagan sana namanan san sanakagan sa sanan mana	international extension in the significant control of the significant contr	ngorum na chapanin matakan manan
Total: 21500 58 2320 -107.9	Total:	215°C C 578 \$ . \$ . \$ . \$	120	107.9.

Source: Interrogation Reports 1989, Crime Branch, Hyderabad.
Crime Rate: Crimes per 1,00,000 population.

Unlike any other city in India Hyderabad has 3 central Business districts (CBD). They are Abid in North Hyderabad, Charminar in South Hyderabad, and M.G.Road in Secunderabad. Crime rate is calculated as crimes per 1,00,000 population. The highest C.R is 622.3 in ward III of Secunderabad. It is lowest at 37.1 in 23 of South Hyderabad.

It is obvious from fig.1 showing the distribution of theft cases that the 3 C.B.Ds show a high crime rate. Crime rate is highest in these 3 centers and decreases tow rds periphery. These 3 areas are the busy commercial areas and offer more opportunities to criminals for committing theft and getting away without being noticed.

Taking the central business districts (CBDs) of Hyderabad and Secunderabad divisions of the city as

in distance from the centre was measured. As a preliminary to this exercise, concentric circles at an interwal of 1 K.M out from these chosen centres were drawn within each of the concentric rings, the population and no. of crimes were aggregated from their ward-wise distribution and crime rate computed (Table.3a).

TABLE: 33

HYDERABAD DIVISION: RELATIONSHIP BETWEEN DISTANCE AND
CRIME RATE-1989.

S.No.	Distance from the centre.km	No.wards	Total Popula- tion	Total crimes	Grime rate (crimes) 1,00.000 population
1	0-1		73,781	178	241
2.	1-2	3,4,15,14,	296,710	515	173,6
3.	2-3		.358,868	334	93,-1
6.	3-4	1,12,23, 16	563,204	380	67.5
5.	4-5	2,6,19	221,821	238	107.3
5.	5-6	9,17	183,917	122	<b>66.</b> 3
•	6-7	18	110,002	81	73.6
) <b>.</b>	7-8	7,8	135,689	226	91

E Source: Interrogation Report: 1989.

Crime Branch, Hyderabad.

TABLE -3b SECUNDERABAD DIVISION RELATIONSHIP BETWEEN DISTANCE AND CRIME RATE: 1989.

S.No.	Distance from the crime (Kms)	No. of wards	Population	Total crimes	Crimerate (crimes in lakhs)
A M	O and I	ll, Ill,IV VII,VIII, V	66417	208	313,2
2.	1-2	VI, IX, X,	140152	101	72.1
3.	2	1, XII	128564	133	103

Source: Interrogation Reports: 1989 Crime Branch, Hyderabad.

TABLE-3C

METROPOLITICN HYDERABAD

RELATIONSHIP BETWEEN DISTANCE AND CRIME RATE: 1989

Division	Correlation coefficient
Hyderabad Division	85
Secunderabad "	81

Source: Interrogation reports: 1939 Crime Branch: Hyderabad.

It is evident from the table i.e. that the distance and crime rate are inversely correlated, with a correlation coefficient of --85 in the case of Hyderabad and --81 in the case of Secunderabad.

#### THE SOCIO- ECONOMIC BACKGROUND OF THE OFFENDERS:

Of the total sample of 118 males account for 97% (115) and females for 3%(table :4)

T A B L E -4

HYDERABAD CITY

MARITAL STATUS FOR THE CRIMINALS-1989

Lartiel st	atus	Males		Femals
Parried	41 %	47	A THE PARTY AND	und temperature placement une tes entitlements.
Unmarried	59%	68		
Total	A Palaine de La communicación	115		3

Source: Interrogation Report: 1989 Crime Branch Hyderabad.

Of the total male offenders 41% are married and 59% are unmarried, the female offenders are all married and one is a widow (Table 4) It can be seen from table 5 that most of the crimminals 76% of the males and 67% of the females reside with their families.

T A B L E -5

HYDERABAD CITY: Links of the criminals with family:

. 이번 사용이 많은 점점이 된 것이 없는 것 같은 것이 없는 것이 없다. 	les			ales
Residing with family		(76%)	2	(67%)
Living separately	28	(24%)	1	(33%)
Total	115		3	

Source: Interrogation Reports, 1989 Crime Branch: Hyderabad.

TABLE-6

HYDERABAD CITY
AGE - SEX- DISTRIB TION: 1989

Age	Meles	Femals
15-20	43 (36%)	
21-25	35 (30%)	1 (8%)
26-30	16 (14%)	
31-35	6 (5%)	1 (.8%)

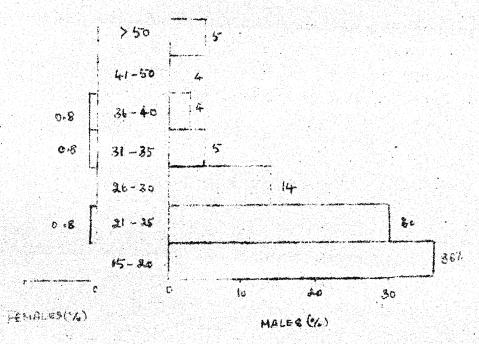
36-40	4	(4%) 1 (.8%)
41-45	· 5	(4%)
>50	6	(5%)
Statistics was well also the statistics and the statistics are an area of the statistics area of the statistics are an area of the statistics area of the statistics are an area of the statistics are also are a statistic area of the statistics are an area of the statistics are a statistical area of the statistics area of the statistics are a statistic area of the statistics ar	and the second second	
All ages	115	

Source: Interrogation Reports: 1989 Crime Branch: Hyderabad.

As mentioned earlier and also infered from table 6 Males out number females account for 97% of the criminals and femals account for 3%. Among them a majority i.e. 66% come under 21-25 age group.

This is also revealed from Fig.2 where the broad base of the age-sex pyramid testifies the predominance of younder age groups among criminals. It is also obvious from the pyramid that the number of offenders decreases with an increase in age. The young individuals seem to be at an advantage and can travel long distances and escape immediately after committing the offence. They also seem more submerable to bad influences of peer groups.

AGE BEX PYRAMID.



FIGIL.

T A B L E - 7

HYDERABAD CITY

SIZE OF FAMILY OF THE CRIMANALS-1989.

Size of the family	No.of criminals	%	
The 2	negative	9%	
3-4	33	28%	
5-6	53	45%	
7-8	18	15%	
> <b>9</b>		3%	
rotel	118	100	negesterad)

Source: Interrogation Reports: 1989.

Crime Branch: Hyderabad.

It is evident from the table 7 that 45% of the criminals belong to the 5-6 size of the family.

## IMPACT OF ENVIRONMENT ON CRIMES:

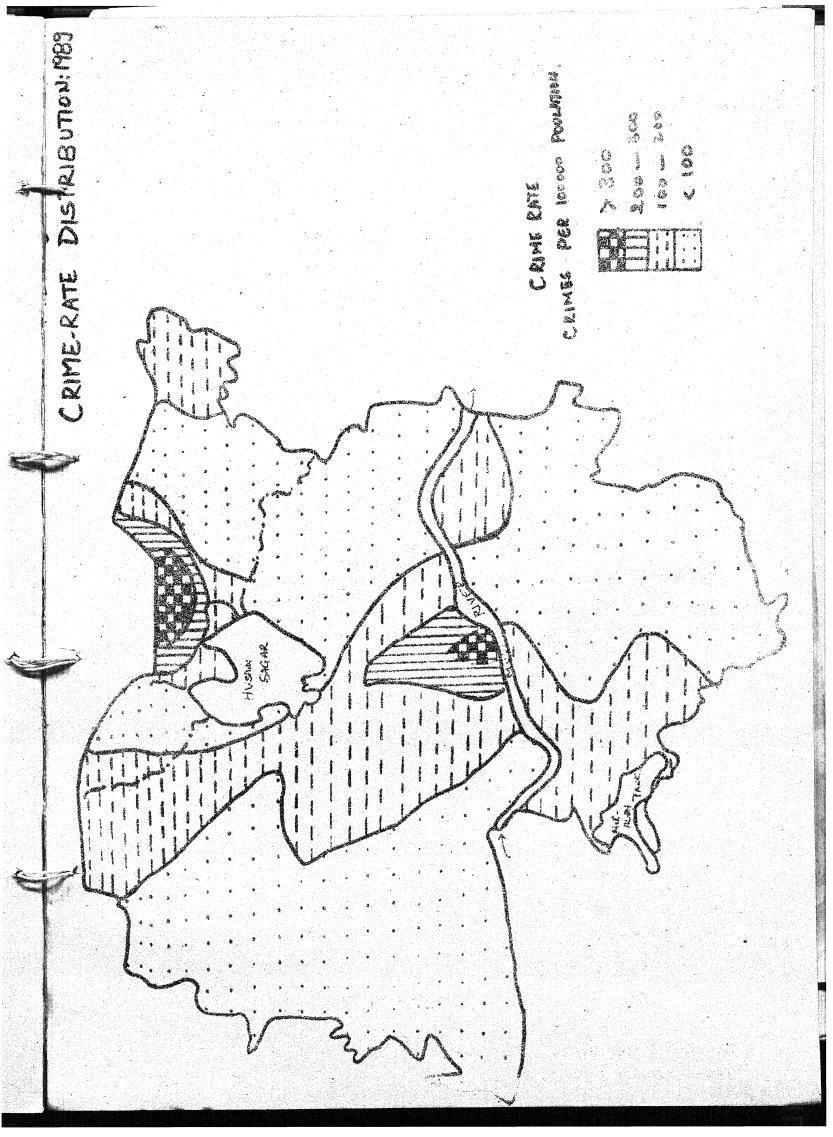
Environment comprise locational and Socio-economic components:

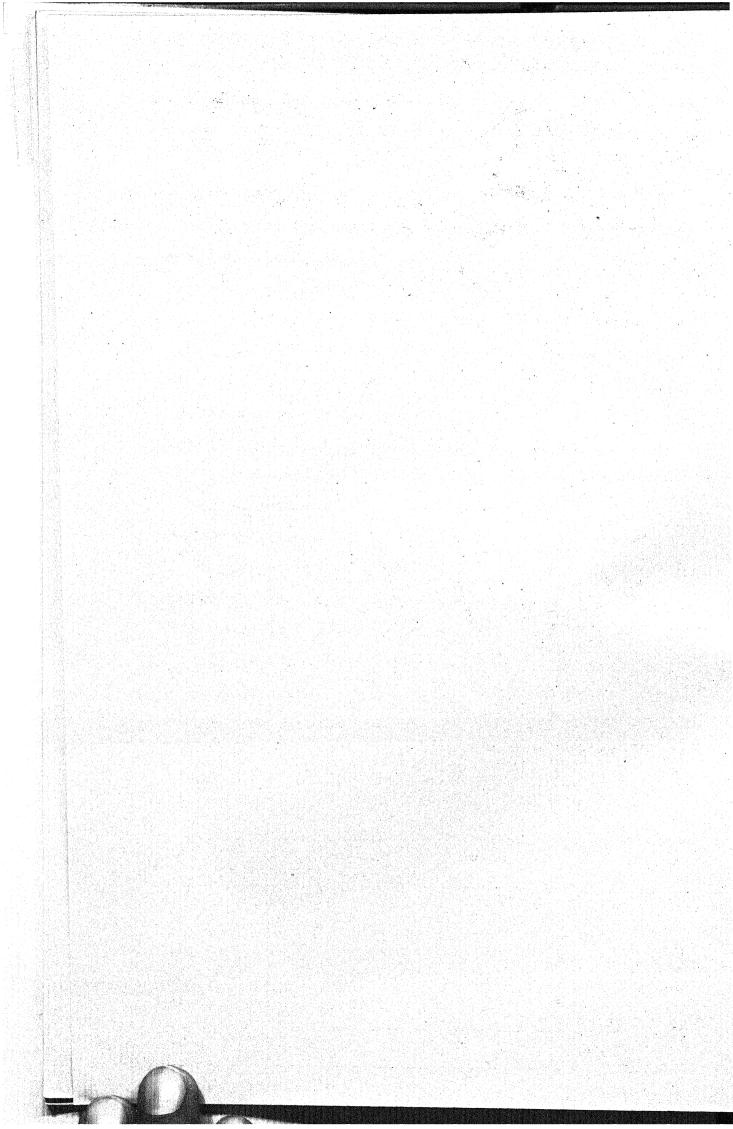
TABLE-8
HYDERABAD CITY
INCOME OF THE OFFENDERS-1989

I neome	No. of criminals	%
600	27	23
600-1200	33 ,	28
1200-2000	9 .	8
2000-3000	5	4
3000-4000	2	2
Not available	42	35
	118	100

Source: Interrogation Report-1989

Crime Branch : Hyderabad.





belong to the very low and low income groups and they live in slums. In Hyderabad there were more than 750 slums in 1987 with a population of 7.5 lakhs. Most of the slum dwellers have migrated from the neighbering districts and are mainly dailywage and marginal workers; who are vulnerable to the economic vicissitudes of urban life. The slums thus are the best breeding areas for criminals who live a life of economic unvertanity. The busy commercial centres provide a conducive ground for crimes to take place. As observed earlier the H CBDs show the lighest crime mates (crimes per 1,00,000 population) It is because first they are busy central places and afford various opportunities to the offenders secondly the offenders can easily escape from the places as it is crowded. Thirdly they are well connected to all places by roads wa and hence offer ease of movement. Fourthly they are in the proximitly of the railway stations for e.g. Nampally, Secunderabad and Kachiguda, and hence are the first landing places of the criminals who are migrants . There fore they are well-versed in the local topography of the environs of the railway stations. They also provide easy escape foutes to the criminals.

According to the table 8 most of the offenders

T A 3 L E -9
HYDERABAD CITY: RESIDENCE OF CRIMINALS AND LOCALITY
OF CRIME: 1989.

S.No.	Residence of criminals	No. of crimes	%
1.	San <b>e w</b> ard	25	21%
2.	Neighbouring ward	23	19%
3.	Otler ward	46	40%
4.	Urban agglomiration	11	. 9%
5.	Other dists/stats	13	11%
Marine and an extension of the state of the	Total:	118	100\$

Source: Interrogation Reports: 1989: Crime Branch Hyderabad.

It has been hypothesized that criminals do not take the localities with immediate vicinity of their residences with case. Table 9 sybstantiates this in a good measure. It is found that 21% of the offenders commit crimes in the same ward to which they belong 19% commit in the neighbouring wards, 40% commit in the other wards and 11% don't belong to the city at all.

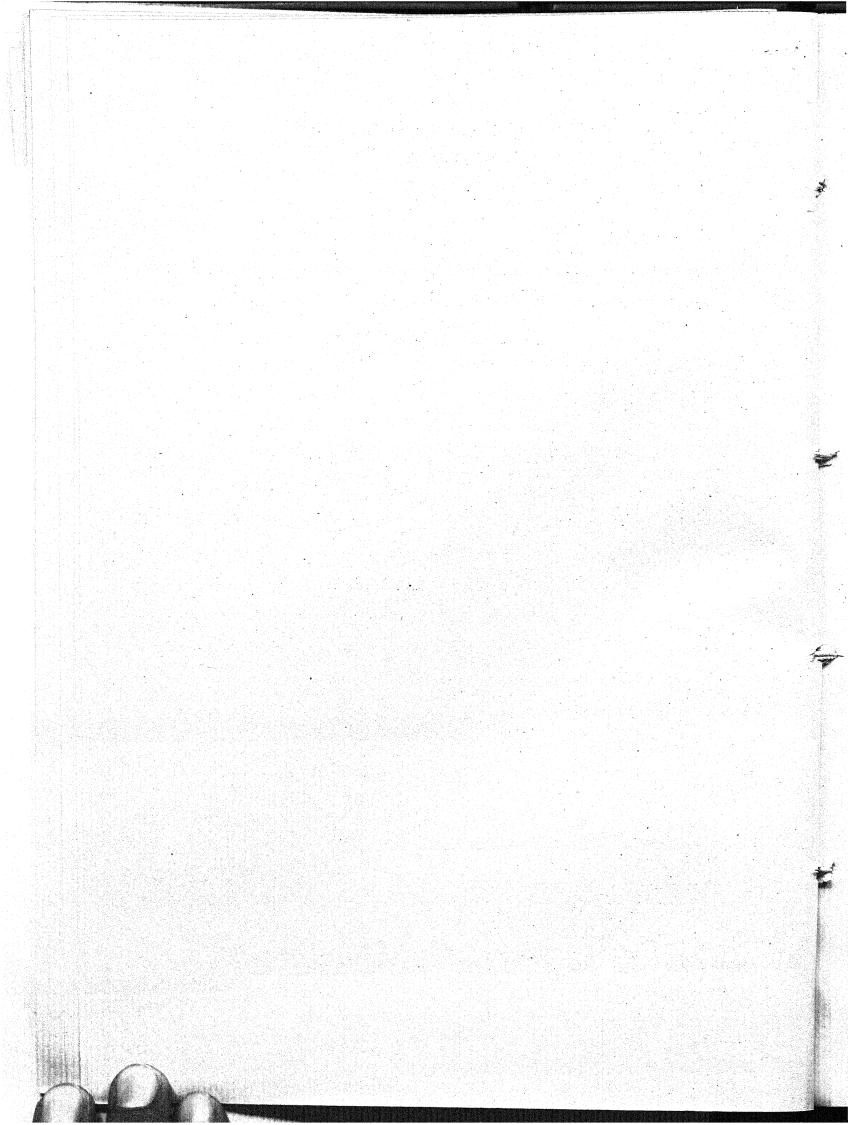
So xm it is also found that 80% of the criminals seem to reside in the city ad only 20% come from other places to commit crimes in Hyderabad. Here is it is again that femiliarity factor of local topograph, that plays a role in decision making of the criminal as also the striking contrast of the economic conditions of the potential victims with those of the offenders.

#### BONGLUS ON &

Environmental criminilogists argue that all people are vulnerable to the temptation to commit some kad kind of crime. But some individuals are much more likely to incline to the temptation than others. In the same way they further argue that some places are much more vulnerable than others are criminals events will tend to occur frequently to such places. The stimulai include the type of target, case of access and the access to and from the place of offence plays an important role in committing crime at a particular place.

So, it can be concluded that the busy commercial centers of Abids, Charminar and M.G.Road vulnerable

are more vulnerable to crimes. The very low and lower income group people and those from large families and those from the younger age groups involved in crimes are more. Crime rate is high in the centre and decreases as the distance from the core of the city increases. It is physical as well as socio-economic environment which influences crime and criminals. The socio-economic environments are namely large families (5-6) low income ( 1200) lack of parental control, bad companies, etc., which make the invididuals nore vulnerable to commit crimes. The physical environment sximesx with busy commercial centres, the promimity to the bus stations and railway station etc. are more vulnerable than to other places and criminals events will tend to occur in these places.



# AGRO-CLIMATIC REGIONAL PLANNING : PATIALA Baldev Singh\*

#### Setting

Should there be agro-climatic regions within a district? Are these conceivable in a district that has broadly a plain terrain? importance of creation of agro-climatic regions in a hilly district is an imperative necessity. In contrast, the need and feasibility of the issue of agro-climatic regions in a plain terrain district is an empirical question. Can we accept same regions for district planning as are created with a focus on macro planning objectives? Since the objective of regionalisation at macro (say state) level is to create homogeneous regions from the macro perspective, these regional groupings are likely to ignore finer, but crucial, inter-district variations. Thus, even when agro-climatic regions of a district exist as a part of a state setting, there is a need for detailed experimentation with agroclimatic variables before coming to a conclusion, as to whether existing regions be accepted, and if not, which new regions be created.

#### Rainfall Variable

Which are the quantifiable agro-climatic variables? Apart

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Author is indebted to the members of Planning Unit, namely Mr. Balwinder Singh, Mr. Kesar Singh and Mr. Devinder Kumar.

图·图图 (1866) 18、1996 (1866) 1966 (1966) 1866 (1966) 1866 (1966) 1866 (1966) 1866 (1966) 1866 (1966) 1866 (1966)

from the slope of the terrain, temperature and wind velocity (the three crucial variables in a hilly setting), the other variables are rainfall, quality and quantity of the sub-soil water and texture and composition of soil. Since Patiala district falls in plain geographical zone, the slope of terrain, temperature and wind velocity variables get diluted importance in the analysis. The data on rainfall variable was collected for each of the thirteen observatories of Patiala district (courtesy Telegram Section, Irrigation Department, Patiala). These observatories are located as two each in Sirhind block (at Adampur and Amloh); Bhuner Heri block (at Devigarh and Hiragarh), Bassi Pathana block (at Aamkhas and Dangarin) and Nabha block (at Bhadson and Allowal); one each in Ghanaur block (at Seel) and Patiala block (at Patiala); and one at Banaur represents two blocks, namely Rajpura and Dera Bassi.

Month-wise rainfall data was collected for twnety years period ranging from 1971 to 1990. To get an index of normal rainfall, month-wise averages of rainfall data of twenty years has been computed for each of the thirteen observatories (Table 1). This normal rainfall data form one of the basis of analysis. Patiala district gets 782.53 milli-metre of rainfall in a normal year (Table 1). More than three-fourths of it is received during the monsoon menths of June, July, August and September. The residual being broadly equally distributed over the other eight months except the months of April, October and November that are relatively, dry. Of the thirteen observatories; Dedhna (Samana

Block) registers minimum rainfall (519 milli-metre) and Banur observatory (Rajpura, Dera Bassi blocks) register maximum rainfall (1115.55 milli-metre). In other words, the normal rainfall scatter is almost hundred per cent. Thus, there exists a case for regionalisation.

verify the degree of variation in rainfall across the month-wise value of the coefficient of observatories, variation has been computed (Table 1). The rainfall variation around annual rainfall (782.53 milli-metre) among the observatories turns out to be 18.6 per cent (the value coefficient of variation). Across months the variation around the respective mean values show no clear pattern either during monsoon months or other months. Nevertheless, the significant degree of the observatories corroborates the variation across regionalisation of Patiala district.

#### Soil Texture Variable

From the development perspective of agriculture, the basic properties of soil relate to its water holding capacity and the capacity to store and supply the planned nutrients. How far these properties stay similar among the different blocks of Patial districts, which fall in Indo-Gangetic alluvial zone. Thus there is need to study the block-wise texture and structure of the soil of the district. Soils are composed of solids, liquids, and gases mixed together in variable proportions. The solids are made of minerals and organic components. Soil texture relate to the size distribution of mineral particles of different sizes, namely, gravel, sand, silt and clay. Depending upon the mix of sand, clay

and silt particles, the soils are usually classified into twelve texture classes (Bishnoi and Brar, 1988, p.51). These are sand, sandy loam, sandy clay loam, sandy clay, clay, clay loam, loam, loam, loam, sandy sand, silty loam, silt, silty clay loam and silty clay.

Of these twelve classes, four textural classes that abound in Patiala district are sand, loamy sand, sandy loam and loam soils. Sand is the dominant constituent of sandy soils. The weight of sand particles in sand soil class is as high as 95 per cent. The other constituents being clay and silt. In Patiala district, this soil class is represented by the sand dunes located in a pocket of Samana block. The sandy loam soil is too dominated by sand particles to the tune of 80 per cent and above. The rest of its constituents being clay and silt particles. This class of soil is found in all the blocks of the district.

Sandy and loamy sand class together explain one-fourth of the soil texture of Patiala district. The third soil class, sandy loam, is too dominated by sand particles, their weight range lies between 75 per cent and 95 per cent limits. The rest being the share of the clay and silt particles. This soil is also found in all the blocks of the district. It accounts, on average, for one-third (32.9) of the soil texture of the district. The above three soil classes put together represent sandy soils of the district. These soils are usually white, permeable to air, water and (plant) roots. They have relatively low water holding capacity and are poor store house for plants. The addition of organic matter into these soils help them to curtail these negative attributes.

The fourth class of soil, loam soil, accounts for more than two-fifths of the area of the district. A loam soil has relatively even mixture of sand, silt and clay (Bishnoi and Brar, 1988, p.53). It is mellow with a some what gritty feel, yet fairly smooth and slightly plastic. This soil class is considered best for vegetation growth. There are considerable variations in the soil texture of different blocks of the district (Table 2). There is, thus additional grounds for regionalisation of the district.

#### pH Variable '

Are soils of Patiala district problem soils? A soil is to be a problem soil when vegetation on it under normal conditions become difficult or non-viable. The problem soils may suffer from the problem of alkalinity, acidity or salinity. To verify whether exist problem soils in Patiala district, block-wise estimates of pH values and EC values have been compiled (Table 2). When the pH value varies from 6.5 to 9.0 the soil is considered to be normal for most of the crops. When pH value is below 6.5 the soil is treated as an acidic soil and require light treatment. No block of Patiala district, like rest of Punjab, has reported acidic soil. When the pH value lies between 9 and 9.3 the soils become moderately alkaline and need application of organic manures like green manure/farm-yard manure. Soils of Bassi-Pathana gives some symptoms of moderate alkalinity (Table 2). When the pH value is above 9.3 the soil suffers from severe alkalinity problems. This problem appears to be present in Sirhind block (Table . 2). Gypsum applications is a must to cure such a soil. However, this problem exists in the blocks of Nabha and Patiala blocks as well as per soil maps of Punjab corroborate each other, this variable is ignored in the rest of the analysis.

#### Electrical Conductivity Variable

soil may contain desired quantities of different salts needed for the crop growth or excess of these. The later situation gives birth to problem soils referred to as saline soils. These contain excess soluble salts which adversely affect the plant growth by restricting the entry of water into plants. Electrical Conductivity is a measure of the presence of soluble salts in the soil. A block-wise estimate of electrical conductivity (EC) in mmhos/milli-metre have been compiled (Table In normal soils the value of EC lies below 0.8 and 1.6 mmhos/cm (Bishnoi and Brar, 1988, p.75). If it lies between 0.8 mmhos/cm then the concentration of salts in the soil is considered high for such sensitive crops as field beans, radish, maize, groundnut, sunflower and grams. Fortunately, soils in all the blocks of Patiala district except Sirhind and Ghanaur, as per EC norms, are normal. In Sirhind and Dera Bassi blocks, the soils appear to be marginally sensitive to sensitive crops. Foilowing Punjab Agriculture University, we consider soils of Patiala district to be saline free soils. Hence, EC variable is ignored in the rest of the analysis.

#### Sub-soil Water/Ground Water Variable

Groundwater helps to supplement surface water supplies. Its quality is good or of marginal quality for irrigation/human

consumption in all the blocks of Patiala district. There are few exceptions, however. These are parts of Rajpura, Dera Bassi, Ghanaur and Bhuner Heri blocks. In these parts, the quality of ground-water varies from marginal to unfit depending upon the amounts of residual sodium carbonate (Hira, Thind and Murty, 1985, p.16). These waters when used along with canal water, however, may be used for irrigation.

Under the impact of development dynamics, however, the draft of water from sub-soil has been more than its recharge. Consequently, its level has been falling year after year in all the blocks of the district but at varying rates (Table 2). For instance, in the post-monsoon period ranging from 1973 to 1987, it has registered a fall from 1.90 per cent per annum (bassi Pathana block) to 8.21 per cent per annum (Nabha block). The depth of the water level also varies across blocks. For instance, during post-monsoon period of 1990 it varied between 5.5 meters (Sirhind block) to 11 meters Bhuner Heri block). In other words, not only the level of water-table differs amongst the blocks, its draft rate has too differed over time. There are, thus, additional grounds for regionalisation of the districts.

#### Terrain Variable

Details of terrain are well encompassed by the elements of relative relief, average slope and dissection index (Sharma, 1968). There are no significant variations in the terrain of the district. The maximum height above the sea level goes slightly over 280 meter in the extreme North-Eastern part (Dera Bassi) and

the minimum height under 230 meter in the South-Western part (Samana). The general direction of the slope is from North-East to South-West. The gradient of the slope is 1:1500. It indicates a featureless flat plain the climate of the district is characterised by semi-arid and continental type (Kaur, Kamaljit, 1990). However, block-wise data on the variations in temperature and wind velocity is not available.

There exist, thus, substantial inter-block variations in the agro-climatic variables, namely rainfall, soil texture, groundwater and terrain. Consequently, there is a case for the creation of agro-climatic regions of Patiala district. It is in this examine background that we the work on agro-climatic regionalisation of Punjab (Figure 2) done by the scientists of Punjab Agricultural University (Prihar, et al, 1990). Using the basis of variations in physiography, quality and quantity of underground water, amount of rainfall and moisture index the state of Punjab has been divided into six homogeneous regions. regions are named as Sub-Mountain Undulating Region, Undulating Plain Region, Central Plain Region, Western Plain Region. Western Region and Flood Plain Region.

As per this work, the district of Patiala is regionalised into three regions, namely Sub-Mountain Undulating Region (Dera Bassi block), Undulating Plain Region (Bassi Pathana, Rajpura and Ghanaur) and Central Plain Region (Sirhind, Patiala, Bhuner Heri, Nabha and Samana). A Flood Plain Region around Ghaggar river is also marked. If we ignore the flood plain region, this

regionalisation broadly appears to be in terms of variation in topography as we move from North-East to South-West.

The agro-climatic regionalisation of Punjab appears to be reasonable at the state level. However, its justification at the district level appears to be a doubtful proposition. For instance, the soil of all the three regions have medium to heavy texture except for Samana, Nabha and part of Sirhind block (Figure 3).

To examine the validity of this regionalisation, inter-block variations in rainfall, ground water, soil texture and terrain variables have been used. Since the unit of measurement of these variables vary from variable to variable, the creation of a synthetic variable calls for the deployment of principal component analysis (Singh, 1978). Alternatively, ranking method (which is unit free) may be used. This is a relatively simple method. However, the classificatory basis on which rank values are based may be, at times, subjective. Nevertheless, it has been deployed to construct a synthetic classificatory variable to examine the viability of existing agro-climatic regions of Patiala district.

#### Norms : Variable Classificatory Base

What norms should be used to rank different agro-climatic variables? Various norms have been used for classifying the variables to ascribe them different ranks. For instance, since higher magnitude of rainfall is considered desirable, more so, when water recharge rate is lower than water draft rate, rank one is assigned to those blocks that receive higher magnitude of

rainfall. The value of rank increases as the magnitude of rainfall received by a block decreases. To be specific, rainfall variable was first classified into three classes, namely 500-700 milli-metre; 700-900 milli-metre; and 900 milli-metre per annum, namely Patiala, Dera Bassi, and Rajpura are each assigned rank 1: those having rainfall between 700-900 milli-metre per annum, namely Bassi Pathana, Sirhind, Bhuner Heri and Nabha are each assigned rank 2. Ghanaur and Samana blocks have rainfall between 500-700 milli-metre per annum are each assigned rank 3.

The ground water variable have also been classified into three classes. Given the art and technology available for pumping water from subsoil, five horsepower out diesel/electricity operated, can pump water upto 50 to 70 feet, that is, from the shallow water zone. However, the cost of pumping even within this water-table range may vary depending on how deep the cavity is dug before fixing the motor. The lower the cavity is dug the more will be the fixed cost, running and maintenance cost. When water falls below this level it often takes a downward jump of 20 or more feet. At this or beyond this level, a different water pumping technology would be required.

The recorded evidence shows that in October 1990, the depth of water table on an average in different blocks ranged between 5.5 meters to 11 meters, i.e. water level is in the shallow zones. Nevertheless, we have classified it into three classes, namely 5.5 to 7.5 meter, 7.5 to 7.5 meters and above 9.5 meters. Of the nine blocks, seven blocks fall in the first category. These are Sirhind, Ghanaur, Dera Bassi, Rajpura, Patiala and Nabha. Only

one block (Bassi Pathana) falls in the second category and two blocks (Bhuner Heri and Samana) fall in the third category. Since the draft power required for the use of sub-soil water increases with the depth of water table, rank 1 is allotted to the most shallow water class (5.5 to 7.5 meters), rank 2 to the medium shallow class (7.5 to 9.5 meters) and rank 3 to the deep shallow class (9.5 meter) and above).

Another manifestation of water-table is the rate at which gets depleted over period. This has been approximated by the annual compound rate of fall in water-table during 1973 and 1987. The annual compound rate of fall amongst blocks of the has varied from 1.90 to 9.35 per cent. Accordingly, this variable has been classified, depending upon the rate of fall, into three categories, namely category-1 (1.5 to 4.5 per cent per annum); category-2 (4.5 to 7.5 per cent per annum); and category-3 (7.5 to 10.5 per cent per annum). The blocks of Bassi Pathana, Rajpura and Ghanaur (as approximated by Rajpura) belong to category-1. The four blocks that belong to category-2 are Sirhind, Dera Bassi, Samana and Patiala. Nabha and Bhuner Heri blocks represent category-3. Since higher the growth rate higher will be the rate of fall and higher the cost of pumping sub-soil water, lowest growth category (category-1) blocks gets rank 1. Accordingly, the category-2 blocks get rank 2 and category-3 blocks get rank 3.

The soil texture variable in Patiala district manifest itself in three classes, namely sandy and sandy loam class, loamy sand class and loam class. The relative distribution of these classes is available block-wise. There are four options to classify this

Classification may use, at a time, relative weight information. of one of the three classes amongst different blocks. The major weakness of this approach is that it emphasises that set of crops that are favoured by that texture class only. This option was, accordingly, not exercised. The fourth option considers all soil texture classes simultaneously but tilt the soil class weight of the block in favour of the dominant class. This approach emphasises the soil sensitivity of the dominant soil class of the block without undermining the role of other soil classes. loam soil class is considered to be best store-house of plant nutrients, followed by, sandy loam soil class, and, sand and loamy sand soil class. The blocks dominated by loam soil class are given rank 1, those dominated by sandy loam class rank 2 and, rank 3 is given to the blocks dominated by sand and loamy sand classes. Accordingly, Ghanaur, Rajpura and, Bhuner Heri blocks get rank 1; Dehra Bassi, Bassi Pathana, Sirhind, Nabha and Samana blocks get rank 2, and Patiala block gets rank 3.

As already mentioned, variables relating to problem soils, namely pH and Electrical Conductivity variables, have been discarded from the analysis.

The slope of the terrain is measured by the height above—the sea level. The slope of the terrain varies in Patiala district as we move from North-East to South-West. Depending upon the height the blocks of Patiala district has been classified in to three categories. Category-1 represents the blocks having height upto 240 meter above sea level (Samana). Category-2 represents—slope

of 240-260 meter (Nabha, Patiala and Bhuner Heri). And, category-3 represents slope above 260 meter (Bassi Pathana, Rajpura, Ghanaur, Dera Bassi and Sirhind). Since cost on leveling of terrain increased with the increase in the slope of soil surface, blocks in category-1 get rank 1, those of category-2 get, rank 2 and those of category-3 get rank 3.

#### Regionalisation

Thus defined ranks of the variables are tabulated block-wise and summed over the variables to examine the possibility of existence of these ranks varies from 7 to 11. Whereas one block (Rajpura) gets rank 7, four blocks (Dera Bassi, Patiala, Sirhind and Bhanaur) each get a rank 9, two blocks (Bassi Pathana and Nabha) each get rank 10, and two blocks (Bhuner Hari and Samana) each get rank 11. Such a ranking of blocks fails to (a) lend support to the scheme of agro-climatic regionalisation of Patiala district propounded by the scientists of Punjab Agricultural University and (b) suggest the formation of agro-climatic regions of Patial district. Except when we conceive Bhuner Heri and Samana Block as one region and rest of the seven blocks as another region, a remote possibility.

This forces us to reconsider the variables that goes into the analysis. The terrain variable appears to be the weakest amongst the chosen variables. Recall, the gradient of the slope of Patiala district is 1:500. This indicates a featureless flat plain. This variable can, therefore, be excluded from the analysis without adversely affecting its credibility.

Accordingly, block-wise sum of the ranks of the variables (excluding the ranks of the terrain variable) are recomputed (table-3). In the scheme of things one block (Rajpura) gets rank 4, two blocks (Dera Bassi and Ghanaur) each get rank 6, three blocks (Patiala, Sirhind and Bassi Pathana) each get rank 7, and Nabha, Bhuner Heri and Samana each get rank 8, 9 and 10 respectively. On grouping these block-wise rank sums in three classes, namely class-1 (blocks with ranks 4 to 6), class-2 (blockswith ranks 7 and 8) and class-3 (blocks with ranks 9 and 10), a contiguous regionalisation at block level emerges.

#### Agro-Climatic Regions

The three agro-climatic homogeneous regions that emerge differ qualitatively from those formed by Punjab Agricultural University (Figure-3). Region-I represents the undulating blocks, namely Dera Bassi, Rajpura and Ghanaur (Figure-4). It is named as UNDULATING REGION. It is interspersed by numerous seasonal torrents which flow mostly during rainy season. These seasonal streams are Ghaggar, Markanda, Tangri, Patiala Nadi and other small seasonal torrents. The Ghaggar river enters the district from North-East direction and takes South-Western direction. banks being low, when it spate its waters spill over the banks causing considerable damage to the economy. Patiala following through the region carries water of several seasonal torrents into Ghaggar river. Besides, a number of other seasonal torrents join Ghaggar while pulsating through the region. water in these torrents move at a heavy velocity when in spate it causes considerable soil erosion.

In terms of acquafer, a major part of the region is known to have inadequate and deep sub-soil water. There exists in these parts a concrete layer of calcareous material underneath the surface at a depth of 10 to 15 feet which is as thick as 6 to 7 feet. Owing to this the rate of percolation is relatively poor in these parts.

In terms of culture, it is under the influence of Haryana.

It is known as "Pauadi". Its language is a mix of Haryanvı and

Punjabi. It is the most backward region of the district.

Region—II represents the upland plain part of the district comprised by four blocks, namely Bassi Pathana, Sinhind. Nabha and Patiala. It is referred as UPLAND PLAIN REGION. It is the most advanced region of the district. In terms of culture, it is under the influence of Malwa region of Punjab and in terms of productivity attributes, it resembles the neighbouring Ludhiana district.

Region-III represents the flood prone plains of the district depicted by Samana and Bhuner Heri blocks. It is named as FLOOD PLAIN REGION. Floods bring debris collected from the upper region which includes the UNDULATING REGION of the district. The accumulation of sand and silt in the beds of streams often result in changing the path of the streams.

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Table 14.3

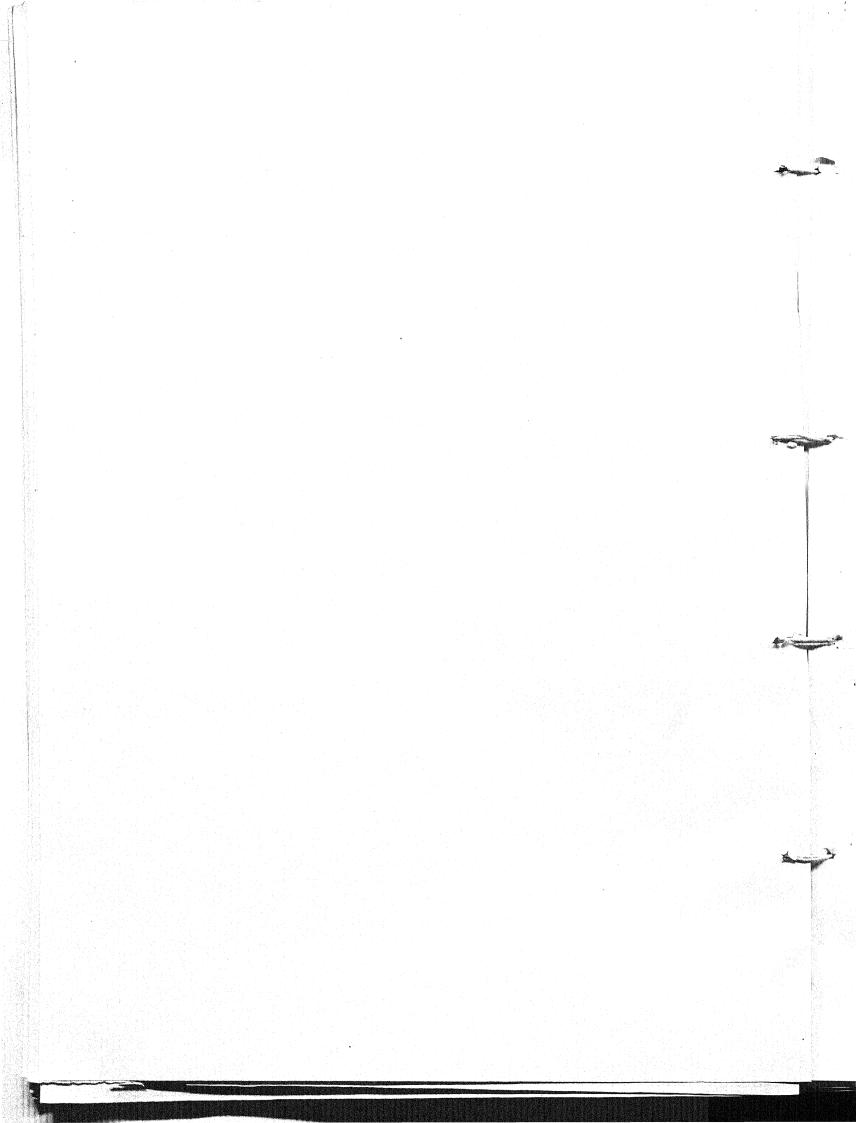
Annepure II

Index of Per Capita State Income at Current Prices: 1970-71 to 1985-86

(All-India = 100)

-	1970- 71	1971- 72	1972- 73	1973- 74	1974- 75	1975- 76	1976- 77	1977- 78	1978- 79	1979- 80	1980- 81	1981- 82	1982- 83	1983- 84	1984 - 85	1985 86
lajor States										, , ,						
Punjab	169	170	175	174	163	170	187	187	188	195	172	178	181	163	174	173
Haryana	139	145	143	140	129	140	152	148	157	143	149	149	152	140	138	144
Matarashtra	124	122	118	125	135	135	141	139	144	150	143	141	140	136	136	132
Gujarat	131	125	107	128	103	121	130	127	124	130	174	134	127	129	123	107
West Bergal	114	118	110	107	108	108	111	106	104	107	106	99	99	102	110	106
Tamil Nadu	92	98	94	91	82	81	87	8.5	8.5	96	8.5	94	86	82	90	91
Karnataka	101	98	93	104	100	93	91	94	91	101	93	94	89	90	93	8.7
Andhra Prudest		95	92	99	101	86	81	84	86	88	87	9.5	91	.90	85	84
Kerala	94	90	93	93	91	93	94	87	89	95	89	83	90	89	88	8.2
Assam	85	83	. 81	74	8 2	76	81	78	80	79	78	75	8.5	81	77	80
Rajasthan <b>Ult</b> ar Pradesh	103 77	89 75	87. 85	100 77	89	86	94	92,	91	77	78	82	86	87	85	79 77
nutric istadesh	- //	/)	83	//	75	70	76	78	75	72	82	74	80	76	76	- 77
<b>M</b> adhya																
Prudesh	76	81	81	84	84	76	72	78	71 70	66	76 71	74 75	75 71	79 75	65	76 75
Bihay Bihay	76 64	72 63	81 67	80 66	71 68	71 64	64 64	71 61	62	63 60	₹0 -	59	39	39	60	60
1017-10-1	•								02				•			
Merstates																
Gos (Incl. Daman & Diu)	145	150	147	148	150	157	166	168	169	189	187	170	192	159	191	184
Nagaland	76	84	95	89	90	100	95	96	101	105	103	117	136	134	171	104
Avunechal			•	0,	,,	100	, ,,	,,,	101	. 103	103	***	1,70		•	
Pradesh	72	73	73	59	76	70	72	85	98	87	89	94	97	89	92	109
Himachal																
Madesh	107	108	108	108	104	105	95	99	103	96	99	106	104	103	94	98
Tammer Tammer	62	69	80	82	80	18	77	78	76	8,7	89	90	87	90	93	92
Koshmir	87	89	36	82	83	90	84	93	98	95	93	90	91	. 91	33	84
Trabova	79	85	75	75	79	79	83	78	81	82	77	12.2	•••	•••		80
Meghalogo	•••	•••	•••	69			•••		81	80	71	71	7 4	63	73	76
Sikim	•••	•••	***	•••	•••	***		•••	•••	54	54	52	57	59	***	•••
· Territorie	<u>s</u>															
Mizeram	189	197	195	177	186	199	202	196	192	196	186	184	186	177	202	210
Pondicherry	130	146	146	156	145	151	152	161	187	269	203	212	192	166	160	147
India	100	100	100	100	100	160	160	100	100	100	100	100	160	100	100	100

t by last column.



						ment - Bl		~~~~~		PATIALA
- Variables	Patiala	Bhuner Heri	Samana i		Sirhind		Rajpura		Dera Bassi	rn:inin
1. Normal rainfall										
(mm) 1971-90	943	808	573	796	320	317	1115	656	1115	732
2. Ground-water							_			
a)Level (Oct,1990)	7.2	11	19.6	7.4	5.5	3.3	6.5	5.1	5.2	7.5
b)Compound growth			•							
rate of fall	6.1	9.3	5.6	3.2	រូ	1.9	3.4		5.4	Ь
(% per annum)										
3. Soil texture										
Classes					<b>.</b>			0.7	51.0	2017
a)Sand, loamy-sand(%)		12.2	35.6	26.4	26.3				75.7	
b)Sandy loam (%)	24.6	31.5	40.8	41.5	43.7	35.9			47.9	32.9
c) Loam (%)	37.1	56.3	23.5	32					25.2	
Surface samples(Nos)	1377	714	1397	1589				225	282	82.83
	(100)	(180)	(199)	(188)	(199)	(480)	(195)	(100)	(100)	(100)
4. Indices of Problem soils										
a) pH	3.2	8.5	7.3	3.1	18.3	9.2	8.2	8.1	8.2	8.5
a) pn h)Electric Conduc-	0.1	~	7.0	J. 1						
tivity mahos/ca	0.42	0.72	3.22	0.23	0.65	0.78	0.8	3.86	0.5	0.63
5. Terrain		2.72		-						
a) Height above sea level(meter)	240-260	240-260	>240	243-263	250 >	269 >	250 )	260 >	260 )	

Source : 1. Mormal Rainfall - Culled from Table-1.

2.Ground-water level , courtsy , Ground Water Cell , Directorate of Agriculture , Patiala -Growth Rate , Singh , Baldev (1989), DISTRICT DEVOLPMENT PLANNING : PATIALA

3 % 4. Soil Texture & Soil Indices , Courtsy , S.P.Saini, District Extension Specialist(SS), Patial

5. Terrain, Courtsy . Dr S.S.Dhillon, Reader , Department of Geography, Punjabi University, Patia

Table - 3:

Block-Wise Ranks of Agro-Clipatic Variables , Patiala

				Deve	lopment 9	locks			
Variables	Dera Bassi	Rajpura	Patiala	Sirhind	Bassi Pathana	Bhuner Heri	Nabha	Ghanaur	Samana
<ol> <li>Normal rainfall</li> <li>Bround-water</li> </ol>	, . i	1		2	2	2	2	3	3
a)Level -> o)Rate of fall -> 3. Soil texture Sub-total	i 2 2 5	! ! !	1 2 3 7	1 2 2 7	2 1 2 7	3 3. 1	1 3 2 3		3 2 2
errain otal 	3 9	3 7	2 9	2 9	3 18	2 11	2 13	6 3 9	11 1 11

Source: Ranks are based on values reported in Table - 2 . For logic of ranks, refer to text.

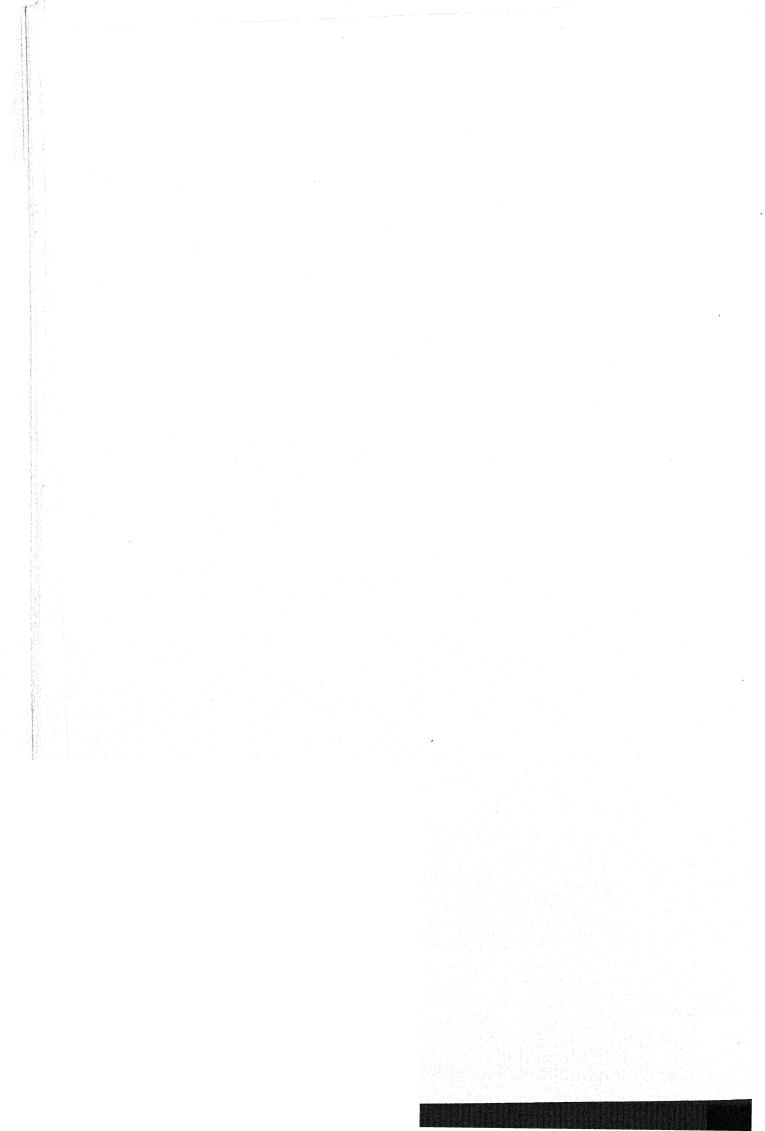


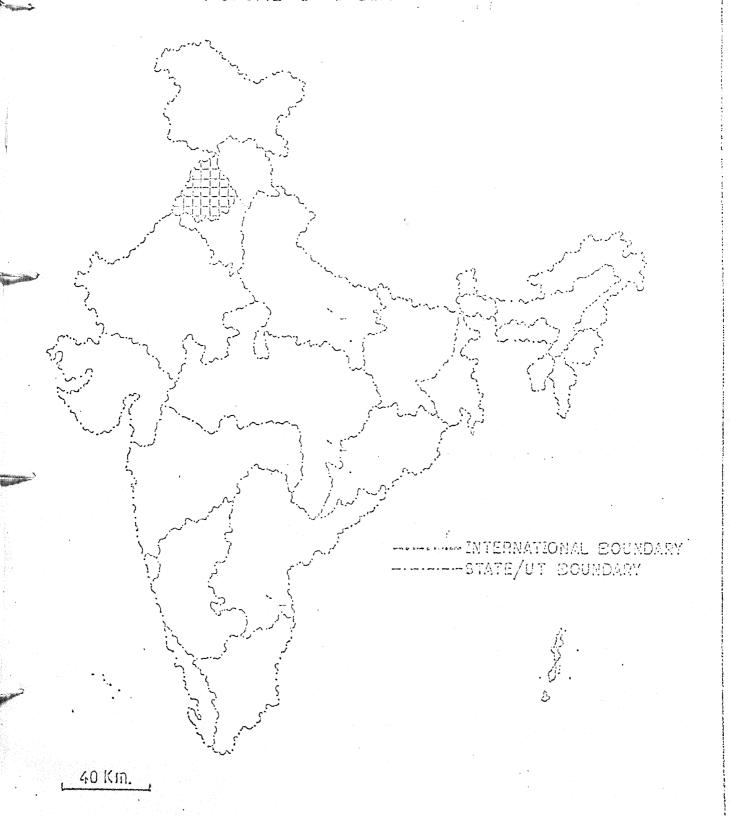
Table - 1 NONTH - MISE THEMTY YEARS AVERAGE RAIN-FALL IN THIRTEEN ORSERVATERIES , PATIALA , 1971-90,

				22 23 24 25	    	COS												
	PATIALA	発品	นาลคอคลาน	DENIERRA E	DHAKETHA	DEPUNA	ANLOR	BUARBER	ALLOWAL	ANYKUAD	ADAMPUR D	ANCARIN	นายกลุ่ง ของเลง	6 KH38	378.8EV. C	Co.of Var	STRAK	¥2
1 11	74.28	22,25	24.53	25, 25	51.44	70.05	38.35	21,38	74,55	1 4 CH	34,250	26,35	32,45	29,58	7.27	24,63	45,78	20,81
ii.	37,85	177	37.00	31.18	28,15	25'27	33,00	29,48	73,18	31,53	34,93	32,48	33, 38	38,22	5,33	17,53	37.65	100 mg
15. 15.	22.	77,75	33, 58	39,65	86.87	18,15	35.68	91.15	48,53	31,78	29.53	33.55	48,73	31,98	7,25	22.32	48.58	13.15
822	21.15	12,45	20, 45	23,33	15, 53	18,33	15,55	15.18	11.95	18,95	18, 25	14,50	15, 23	17.23	3,23	85 81	23, 38	11,95
>- 2 2 3 3	20.00	12, 33	35, 55	42,34	25, 25	22,50	27.95	23, 75	21.48	31,88	25,85	53,42	33,35	25.63	5.82	21.69	42,38	13,03
1000	78.38	61,58	54,83	87,68	70.19	36.75	61.38	49,85	627	61,25	75.73	55, 98	113,28	12.20	17,45	26.35	113,28	46.75
E5	57.4 TO	217,95	20, 20, 2	236, 19	257, 197	162,53	225,85	225,45	213,45	259,55	21.127	238,38	50,015	235,83	37.88	16,81	319,85	162,88
21. 21.	285.18	178.65	221,15	237,95	164,48	133,56	215.78	205, 15	191.75	247, 28	258,75	242,68	322.18	223,43	137 ° 3	21,79	377,18	133,33
61. 1.11 1.12	12 CO.	10.25	51,50	17, 20	15 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	39,50	63,50	52,25	44	37,35	69 69 69	73,13	25,15	19.19	23,33	53. 53.	144.12	17, 52
(C)	62.	13.	13.15	673	E 64	2,59	60	12.75	41- 41-	7,75	5,68	J /	13.75	9.32	100 100 110 110	45.53	18,75	7.38
762	C. 7.	03	37,75	11, 50	6. 6	17.72	100 PM	12, 53	4.1	11,78	62	97.5	E. 35	11.28	1.00	14,05	13,58	8,28
ital lad en	25,65	32,32	22.45	20.85	17.55	er er	24.24	21.33	19.00	86.65	25, 13	57 197 50	53.98 13.98	21,53	rij Lij	23,75	73, 33	65 65 65 65
123	3:17:4	455.58	22,527	63. 130 63. 130	621.72	33 ' 15 31 - 15	742,55	789,38	100	353, 35	83.5,68	331.33	50 ST	752,53	145, 68	50	33.5	519.63

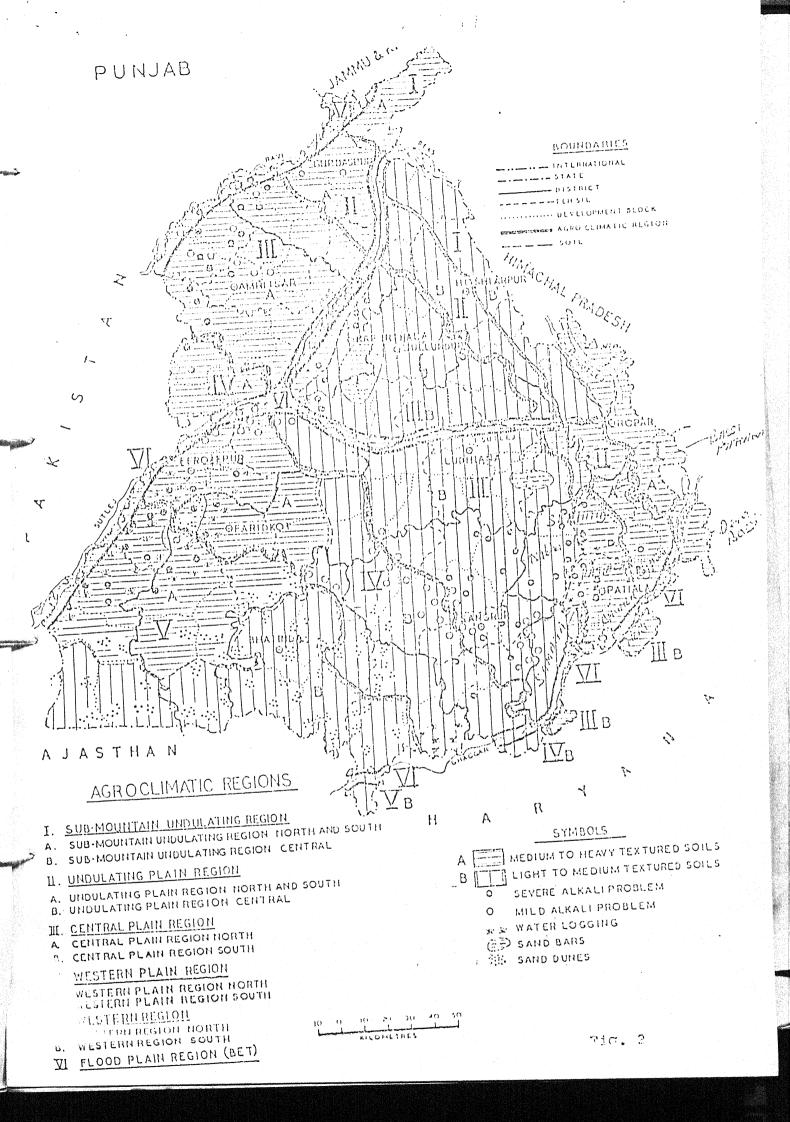
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### PUNJAB IN INDIA

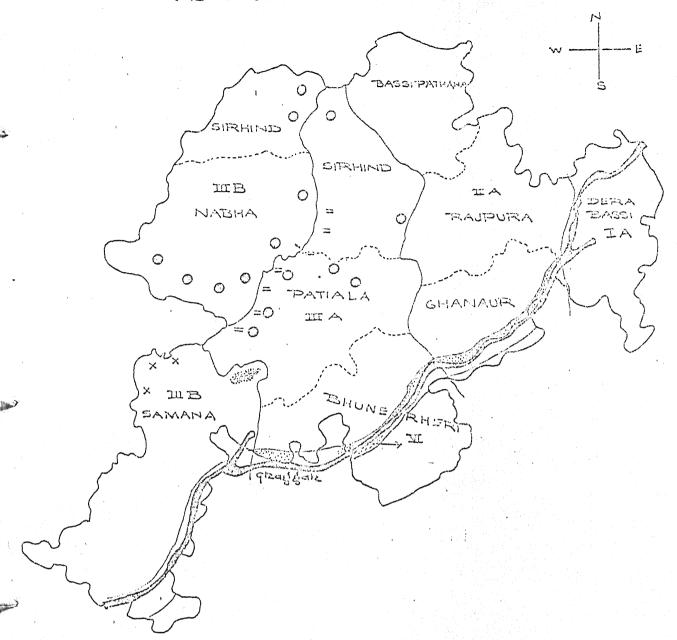








## -AGRO-CLIMATIC REGIONS: PATIALA DISTRICT



- I. Sub-Mountain Unfulating Region
- II. Undulating Plain Recion
- JTT. Control Plain Recion
- VF. Plood Plain Region

#### Symbolia

- A Medium to Heavy Mortured Soils
- P Light to Modium Contured Toils
- X rile Alkali Troblem
- O Severe Alkeli Problem
- = Weter Locaina
- 68 Send Dunes

Scalo: 1 CM = 6 Pms (approx.)

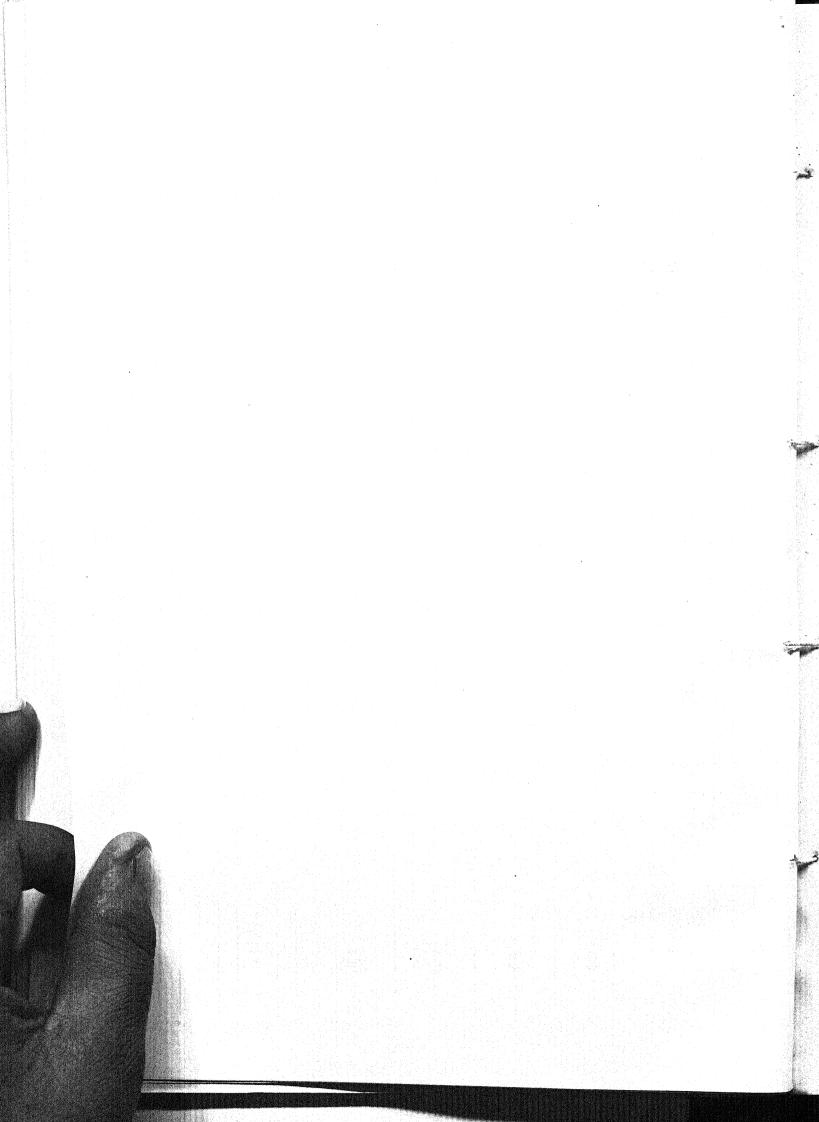


# PATIALA DISTRICT AGRO-CLIMATIC REGIONS





130° Gujaret ® e kaindaka Karratako Sujar at Tamil o principal Resident Nach 110 Purpos o 0 Month Eastern & Maryana & Andhar Pocdell Rajerethano 100--0 100 Haryaslad Raisthan , owell senger from manningshoa naharentra 80 MOIA & BENSON Other Avenu pullak Kenala & 70 D Prodeth & Crissa Medhya of 60 a Blhar Citiar Prablesh 50 40 Billian -30 4 Orissia North Eastern 20 本 1561 1961 1941



## SUBSISTENCE SYNDROME AS A CONSTRAINT TO AGRICULTURAL DEVELOPMENT IN UTTARAKHAND

#### B K JOSHI\*

#### I. <u>Introduction</u>

In this paper an attempt has been made to identify the "subsistence-syndrome" as an important constraint to agricultural development in Uttarakhand and to analyse its implications for the regional economy and the reasons for its persistence.

Uttarakhand refers to the eight hill districts of Uttar Pradesh viz., Dehra Dun, Uttar Kashi, Chamoli, Tehri Garhwal, Garhwal, Naini Tal, Almora and Pithoragarh, which constitute the two divisions of Garhwal and Kumaun. The area of Uttarakhand is 51125 Sq.Km. and its population 58.74 lakhs according to the 1991 Census.

The paper is based on data collected in 1985-86 for a research project in the Giri Institute of Development Studies. In all 2004 households spread over eight village clusters — one in each district — were surveyed. In selecting the locations for study we followed a two-stage process. In the first stage we identified the main and sub-watersheds in Uttarakhand from the maps prepared by the Directorate of Land Survey of the U.P. Forest Department, and matched the watersheds and sub-watersheds with the boundaries of the districts and blocks. We then selected eight sub-watersheds in such a way that each of the districts and major watersheds was represented. Finally in each of sub-watersheds we

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selected a cluster of villages on the basis of a field trip and personal observation with the following criteria in mind:

- i) They should be located in the same micro watershed.
- ii) They should form a cluster with about 250 households in each cluster; and
- iii) They should represent different altitudinal ranges with the maximum number of clusters being located in the range of 3000 to 5000 feet above mean sea level as the largest concentration of population in Uttarakhand is located in this altitudinal range.

Based on these criteria we selected 51 villages grouped in eight village clusters. Since each cluster contained about 250 households we surveyed each one of them on a census basis. The village clusters selected for study (named after the microwatershed in which they are located) along with details of their location, number of villages and number of households is given below:

Village Cluster	District	Block No.of	Villages	No. of Households
1. Naukuchiya Tal	Naini Tal	Bhimtal	9	235
2. Kuntola	Pithoragarh	Gangoli Hat	<b>.</b>	251
3. Lower Kuthlad	Almora -	Chaukhutiya	7	248
4. Birganga	Chamoli	Dasholi	5	252 '
5. Ladoligad	Garhwal	Pabau	6	254
6. Dhanarigad	Uttar Kashi	Dunda	3	250
7. Debligad	Tehri Garhwa	l Jaunpur	5	240
8. Bhatnalagad	Dehra Dun	Kalsi	7	254
			<b>3</b> 1	2004

#### II. Subsistence Syndrome: The Evidence

At the outset it will be relevant to explain briefly what is meant by the term "subsistence-syndrome" as used in this paper. Essentially the term is being used to describe a situation where a number of factors — economic, social and attitudinal — exist in a mutually supporting and reinforcing manner, in such a way that the

combined effect is to strengthen and maintain a system where even though the population is largely dependent on agriculture as the main source of livelihood, agriculture is oriented almost exclusively towards production for home consumption. There is concomitantly a heavy relience on production of foodgrains with very low levels of commercialisation.

A quick look at the structure of the household economy (Table 1) shows that an overwhelming 94 per cent of the households in all the eight clusters are dependent on agriculture (whether as cultivators or as agricultural labourers, with over 91 per cent being cultivators) for their livelihood. In individual clusters the percentage of households for whom cultivation is the main source of livelihood varies from a low of 80 (Naukuchiya Tal) to a high of almost 99 (Debligad).

After agriculture the next important source of livelihood for the people is service with about 4 per cent of the households in all the clusters combined being dependent on it for their livelihood — the highest percentage (over 8) being in Naukuchiya Tal and the lowest (less than 0.4) in Debligad. In Bhatnalagad none of the households reported service as the main source of livelihood.

It may thus be concluded that the economy at the household level in rural Uttarakhand is predominantly agrarian. At the same time, we also find that agriculture is not able to meet the needs of the people so that they have to resort to secondary sources of income. Thus we find that about 64 per cent of all households have reported secondary sources of income (Table 2), with a low of about 14 per cent in Bhatnalagad and at the other extreme a high

of almost 90 per cent in Kuntola. Among those reporting secondary sources of income, over half the households derive it from service and over one-fourth from non-agricultural labour.

Though agriculture provides the mainstay for the bulk of the population in all the eight clusters, yet it is beset by a number of problems. The most important of these are the predominance of small and marginal holdings and the lack of irrigation facilities.

pattern of land ownership in the eight selected clusters is given in Table 3. It will be seen that there is a predominance of small and marginal holdings in all the clusters except one (Bhatnalagad). In all the eight village clusters taken together about 93 per cent of the households own less than five acres each while the area under such holdings constitutes 68 per cent of all land. Over 21 per cent of the households own less than 0.5 acres each and over 48 per cent own less than one acre each and the area under holdings less than one acre comes to about 16 per cent of the total land owned. About 7 per cent of the households own five acres or more each though they control almost one-third of all The average size of family holdings in all the eight land. clusters taken together is about 1.5 acres. In individual clusters it varies between 0.60 acres (Kuntola) to 4.29 acres (Bhatnalagad).

Inequality in the distribution of land-holdings, as measured by the Gini coefficient is not very high. For all the clusters combined it comes to 0.524. In individual clusters it varies from a low of 0.270 (Ladoligad) to a high of 0.552 (Birganga).

The extent of irrigation is given in Table 4. It will be seen that overall in all the eight clusters combined only 17 per cent of the cultivated area is irrigated. In individual clusters the extent of irrigation varies between a low of 0.6 per cent (Bhatnalagad) and a high of 48 per cent (Dhanarigad). The wide variations in the area irrigated between different clusters is largely due to the fact that the availability of irrigation facilities is highly location specific in Uttarakhand. Villages located close to rivers and perennial streams have, in general, better irrigation coverage than those which are not so favourably located, because these rivers and streams are the main source of irrigation through the construction of small gravity channels called Guls.

Thus with a predominance of small and marginal holdings and low levels of irrigation, it is but natural that agriculture for most of the cultivating households remains a susistence activity following a traditional technology and traditional cropping cycle. The pattern of agricultural production for the sample households is given Table 5. The cropping pattern shows a predominance of cereal crops which are grown for home consumption. Thus we find that paddy, wheat and mandua (ragi) account for the bulk of the agricultural produce.

Though pulses are grown in all the clusters they can hardly be considered an important crop except in Dhanarigad. The cropping cycle most commonly followed is: Paddy — Wheat — Mandua — Fallow giving three crops in two years.

The main (perhaps, the only) cash crop in Uttarakhand is potato. Our data show that potatoes were grown in 6 of the 8

clusters. However, it will be seen that only in 4 of them does it constitute a major crop, while in one viz., Debligad it turns out to be the most important crop in terms of production. Debligad in fact appears to be especially suited to the production of potatoes as is evident from the yield which is almost three times that of the other clusters where it is an important crop.

Data on the sale of agricultural produce, given in Table generally confirm the picture of a subsistence economy which has been painted above. It will be seen that only a very small part of the agricultural produce is sold. Thus we find that in two village clusters, Naukuchiya Tal and Kuntola, there was no sale of any agricultural produce. In two others, Ladoligad and Debligad, only potatoes vegetables and maize (latter two being included in the category 'others) were sold. Thus three clusters Dhanarigad, Lower Kuthlad and Birganga - accounted for the sale of most of the agricultural produce and of these the first two are more important than the third. These two village clusters also happen to be the ones where more than 40 per cent of the cultivated area is irrigated. Furthermore, it will be seen that Dhanarigad accounted for 70 to 100 per cent of total quantity of cereals (mandua, wheat, paddy) and pulses sold in all the eight clusters combined.

The total quantity of foodgrains sold, however, represents only a small part of the total production. Thus we find that in all the eight clusters combined, sale as a proportion of total production was only 2 per cent in the case of wheat, 1.5 per cent in the case of paddy, 1.4 per cent in the case of mandua and 7 per

cent in the case of pulses. Even in Dhanarigad which accounted for the bulk of the produce sold, only 2.6 to 4,1 per cent of the total production of different cereals was sold while the corresponding figure for pulses was 12 per cent.

The number of households reporting sale of agricultural produce is also very low. Except in the case of potatoes and vegetables, less than one per cent of the households in all the clusters combined reported sale of agricultural produce. Even in Dhanarigad where the largest number of households have reported sale, the percentage of such households does not exceed 4 in the case of any foodgrain crop.

The only crop grown mainly for the market is potato and to a lesser extent vegetables (included in 'others). Thus we find that in the clusters reporting sale of potatoes between 30 and 97 per cent of the production was sold. The maximum sale took place in Debligad, which as we saw, was the largest producer of potatoes accounting for over 80 per cent of total production of this crop. Overall we find that 85 per cent of the total production of potatoes was sold. The distressing feature is that potato is an important cash crop in only one cluster of villages viz. Debligad. It is only here that the area under potato is comparable to that under wheat and paddy.

Based on the data on production and sale of agricultural produce in all the eight clusters it may be confidently asserted that agriculture, though the mainstay of the population of Uttarakhand, is essentially a subsistence activity, with heavy emphasis on the production of foodgrains for home consumption with extremely low levels of commercialisation.

#### III Implications for the Regional Economy

The persistence of the "subsistence-syndrome" as outlined above has serious implications for the development of the regional economy. With a large part of the population dependent on agriculture for its livelihood and with agriculture being a subsistence activity for most of the rural households, it is but natural that hardly any surplus is generated in the agricultural sector. Thus investment of capital in agriculture is bound to be low. With hardly any capital formation and reinvestment in the agricultural sector, the subsistence economy only gets reinforced, which in fact is the essential characteristics of the "subsistence-syndrome".

The implication of such a subsistence-oriented system is that a large part of the population cannot hope to improve its standard of living through the main economic activity in which they are engaged, viz., agriculture. They can, at best, hope for a full year's supply of foodgrains. For the rest they have to take recourse either to secondary sources of income or to migration on the part of able-bodied men. Both these phenomenon are rampant.

Agriculture, as carried out at present, does not generate any surplus, while the secondary sector is virtually non-existent. In such a situation government expenditure becomes the main source for not only financing development but also capital formation in the private sector. This is happening via the mechanism of contracts for construction of roads, buildings, infrastructure facilities like water supply, power distribution, irrigation canals etc. All these activities, incidentally belong to the

tertiary sector. In this way what is emerging is an economy resting on subsistence agriculture with a weak secondary sector and a relatively large tertiary sector fuelled by heavy government spending. The surplus generated in the tertiary sector is invested in one of several ways: in productive activities outside the region; in further tertiary sector activities within the region e.g. transport, especially passenger transport, retail trade, hotels and restaurants; and in real estate. Hardly any investment is being made in the productive sectors of the economy, least of all in the agricultural sector.

In this way a lop-sided pattern of economic development is emerging which shows certain outward signs of progress like increased consumption expenditure, real estate development, transport development, increase in retail trade etc. All of this, affects only a small section of the population which because of its links with the governmental system is able to take advantage of the government expenditure and derive benefits in various ways legitimate as well as illelgitimate. The vast majority of the population - especially the rural population - are by-passed by system and continue to be dependent on subsistence cultivation. Since cultivation in many cases cannot provide even a full year's supply of foodgrains, especially in the rainfed upland regions, the people perforce have to resort to other means to supplement their income. As a result, the men-folk have been traditionally moving out of the area, often to larger cities in the plains or to join the armed forces and para-military forces, search of employment. Remittances from such people become an i'rı important source of cash incomes for cultivating households.

Obviously, in such a situation income inequalities are likely to increase with adverse social and political consequences.

An important social implication of the outmigration of male labour force needs special mention because of its special role in constituting the "subsistence syndrome" which we have identified as a major contraint to agriculture development Uttarakhand. This is the heavy involvement of cultivation and agriculture activities. In one sense there hardly anything new about this feature as women in Uttarakhand have traditionally been involved in agriculture in a major way. What is new is that in many areas they are fast becoming the sole labour force in agriculture because the men either have left the villages in search of employment or, though resident in the villages, they are pursuing secondary occupations e.g. government service, petty trading or labour (mainly non-agricultural) etc. In addition to working in the fields the women have to perform not only their traditional household chores but also fetch water, fuelwood and fodder and look after the animals. This is indeed a very heavy burden. Under these conditions, therefore, to expect the women to think of commercialisation of agriculture, especially when their holdings are very small, irrigation facilities lacking and risks in changing from the traditional pattern of cultivation too big, is expecting too much.

Looking at the existential condition of the people in the rural areas of Uttarakhand, subsistence cultivation surely is a strategy of minimising risks even though at low levels of productivity. Its major appeal is that it provides a certain basic level of food security which, combined with other sources of

income — whether from secondary occupations or from remittances — can see the family through in normal circumstances.

In any case, the implication of women being the main workers for the in agriculture is far-reaching in other ways too persistence of the subsistence orientation. For instance, women may be the main workers (many times the sole workers) on the but they are far from being either owners of land or even the decision makers, which continues to be the preserve irrespective of whether they are present in the villages or not. Thus even if the women want; they cannot pledge their land to take loans for making investments on land and for changing over to commercial crops, or take advantage of any official scheme for the development of agriculture. The official development extension machinery continues to be heavily male-oriented. Though it may recognise that agriculture in Uttarakhand is female dominated, it makes no attempt to reach out to the women, so that any plan it may have for development of agriculture is not likely to be realised.

# IV Conclusion: The Way Out

The question that the foregoing analysis obviously leads to is: If the subsistence-syndrome is so deep-rooted then how can agriculture in Uttarakhand break out of its vice-like grip? The answer is not an easy one; but it is also clear that unless the hold of the subsistence syndrome is broken, the development of the common people of Uttarakhand cannot be ensured.

Any significant shift in the workforce away from agriculture into secondary and tertiary activities appears unlikely in the

prevailing situation. Therefore a relevant development strategy for the region, at least in the short and medium term, will have to be a land based-strategy especially in view of the fact that an overwhelming majority of the people are dependent on agriculture for their livelihood. It is only in this way that the dispersal of the gains of development and growth to the largest number of people can be ensured.

A land-based strategy of development designed to overcome the constraints of subsistence agriculture implies (i) diversification from crop husbandry to allied activities like animal husbandry and other off-farm activities, and (ii) a gradual shift to the cultivation of cash crops in place of the extensive dependence on foodgrains. These two options need not be considered mutually exclusive but should appropriately be seen as complementing each other. The pafticular activity or choice of cash crops would differ from location to location and even from household to household as all activities or crops need not be suitable for all areas or even all households in the same area. Due allowance would therefore have to be made in the strategy for such flexibility.

The success of such a strategy ultimately depends on strong governmental and institutional support in the form of Research and Development effort, credit and marketing facilities, organisational innovation and above all extension effort designed to reach out to the women and involve them in the development effort. The last would require attitudinal changes not only at the societal level but also on the part of the official development machinery — admittedly a very difficult task.

Table 1: Main Sources of Household Income

Village Cluster			Non-Agri. Labour		Business	Others
Naukuchiya Tal	189 (80.43)	13 (5.53)	10 (4.26)	19 (8.08)	3 (1.28)	1 (0.43)
Kuntola	217 (86.45)	16 (6.37)	7 (2.79)	10 (3.98)	(0.40)	
Lower Kuthlad			6 (2.42)			(0.40)
Birganga	220 (87.30)			17 (6.75)	6 (2.38)	6 (2.38)
Ladoligad	247 (97.24)		1	7 (2.76)		
Dhanarigad	238 (95.20)		2 (0.80)			
Debligad	257 (98.85)			1 (0.38)		
Bhatnalagad	250 (98.43)				(0.79)	
Total	1833 (91,47)	46 (2.30)	25 (1.25)		12 (0.60)	

Figures in parentheses represent percentages

Table 2 : Secondary Sources of Household Income

Village Cluster	Culti- vation	Agri. Labour	Non-Agri. Labour	Service	Business	Others*	Total Reporting	% Reporting
Naukuchiya Tal	1 (0.57)	39 (22.29)	49 (28.00)	67 (38.29)	17 (10.86)		175 (100.00)	74.47
Kuntola		48 (21.33)	73 (32.44)	76 (33.78)	16 (7.11)	12 (5.33)	225 (100 <b>.</b> 00)	87.44
Lower Kuthlad		16 (8.38)	36 (18,85)	122 (63.87)	11 (5.76)	6 (3.14)	19 ( (100.00)	77.02
Birganga		1 (0.47)	66 (31.28)	102 (48.34)	12 (5.69)	30 (14.22)	211 (100.00)	83.73
Ladoligad		6 (2.69)	15 (6.73)	167 (74.89)	7 (3,14)	28 (12.56)	223 (100.00)	87.80
Dhanarigad		1 (0.72)	66 (47.83)	63 (45.65)	4 (2.90)	4 (2.90)	138 (100.00)	55,20
Debligad		5 (6.58)	28 (36.84)	24 (31.58)	12 (15.79)	7 (9.21)	76 (100.00)	29.23
Bhatnalagad		1 (2.86)		19 (54.29)		15 (42.86)	35 (100.00)	13.78
Total	1 (0.08)	117 (9.18)	333 (26,14)	640 (50.24)	81 (6.36)	102 (8.01)	1274 (100.00)	63.57

Figures in parentheses represent percentages \*Includes traditional trades and services

Table 3 Percentage Distribution of Households by Land Holding Size

Land Holding Size Class							1	/illag	e Clus	ter								
(Acres)	Nauku tal	chiya	Kun	tola	Lower Kuthl	ad	Bir	ganga	Ladol	igad	Dhana	rigad	Deb	ligad	Bhatn	alagad	All C	luster
	Zof HH	Zof Area	100	%of Area		%of Area		%of Area	Zof HH	%of Area		%of Area	%of HH	%of Area		%of Area		%of Area
Landless	3.83		6.37		7.26		6.35		1.97		0.40		1.54		0.39		3.49	
Less than 0.5	31.06	7.00	36.25	16.45	25,40	5.70	27.78	6.19	5.51	1.48	20.00	3.64	23.46	5.67	1.18	0.06	21.21	3.68
0.5 - 0.99	27.66	14.39	40.24	44.76	27.42	18.62	29.37	16.72	31.89	18.63	16.80	7.54	38.08	22.17	6.30	0.75	27.25	11.94
1.00 - 1.99	23.83	25.34	15.54	31.13	27.82	34.89	19.84	22.58	47.24	51.06	38.00	36.81	21.92	26.86	11.42	3.40	25.70	22.20
2.00 - 4.99	12.34	39.86	1.20	4.33	11.69	30.68	15.48	30.79	13.39	28.82	23.20	46,17	12.69	31.98	33.46	24.88	15.47	29.77
Five and above	1.28	13.41	0.40	3.33	0.40	10.10	1.19	23.72	· · · · · · · · · · · · · · · · · · ·	-	1,60	5.84	2.31	13.31	47.24	70.91	6.89	32.40
All Classes	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Average Size of holdings (Acres)	1	.11	0	.40	1	.00 _	1	.18		. 18		.37		.15	4	.29	1	.49
Gini Coeff.	. 0.	549	0.	359	0.	<b>489</b>	0.5	552	0.	270	0.:	382	0.	456	0	272	0.	524

Table 4

Extent of Area Irrigated (Area in acres)

Village Cluster	Total Land	Irrigated	Area	% Area Irrigated
		PRINTELLEN, COLUMNIA, ALLANDONA, PRINTELLEN, COLUMNIA, C		- PERSONAL CONTINUES OF STATE
Naukuchiya Tal	261.02	51,30		19.43
Kuntola	150.03	50.47		33.44
Lower Kuthlad	247.52	100.50		40.40
Birganga	297.61	14.17		4.76
Ladoligad	(300.61	32.50		(0.81
Dhanarigad	342.30	164.00		47,91
Debligad	300.07	89,96		29.98
Bhatnalagad	1090.04	6.83		C.43
Total	2989.20	509.73		17.05

<u>Table 5</u>

<u>Area and Production of Principal Crops in the Selected Village Clusters</u>

A = Area in Acres P = Production in Quintals

Cluster	Whea	ı <b>t</b>	Pac	idy	Man	iua	Pol	tato	Pul	jes 	Othe	Y 5 %
	A	<b>P</b>	A		A	P	A	<b>P</b>	A		A	P
laukuchiya Tal	201.80	623.50	70.25	371.52			1.80	7.50	33.60	88.50	105.10	485.48
(untola	114.03	320.46	68.40	509.55	26.50	106.45	0.25	12.80	9.05	19.45	48.57	297.42
_ower Kuthlad	141.43	1038.99	150.45	1406.41	45.05	244.80	18.41	540.50	1,10	3,35	3.40	25.20
Birqanga	138.79	675.10	142.85	1168.02	76.26	471.97	6.90	205.30	14.10	74.71	40.31	175.15
_adoliqad						1027.40				181.00	51.21	902.12
Dhanarigad			210.12	4197.85	66.15	1271,84			30.85	529.25	15.80	1467.30
Debliqad		523.49	81.67	725.85	27.95	340.30	54.45	5081.50	9.85	2.21	16.52	426.33
Bhatnalagad		372.50	21,33	39.50	329.35	539.90	2.00	2.00			865.45	4537.658

\* Includes vegetables

a Mainly Maize

Table 6 : Sale of Agricultural Produce (Qty. in Qntls.)

Village Cluster	Wheat	Paddy	Mandua	Potato	Pulses	Others	
Naukuchiya Tal							
Gty.	en e				2012 - 1913 - 1913 - 1914. Barana - 1914 - 1914.		
No. of HH			, 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	(11 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
Kuntola Oty.		••••					
No. of HH							
Lower Kuthlad							
Oty.	27	37	9	241.5	0.70		
	(2.60)	(2.63)		(44.68)	(20,83).		
No. of HH			4	33	•		
날등 없이 되었다면 나를 다 다니?	(2.17)	(2.17)	(1.94)	(14.34)			
Birganga							
Qty.		2		199			
		(0.17)	(2.12)	(96.93)			1
No. of HH		1		16			
Ladoligad	(0.42)	(0.42)	(0.42)	(6.77)			
oty.							
				124		60	
No. of HH		pist u <u>l</u> 111 a.		(30.53)		(6.65)	
				6		<u> </u>	
Dhanarigad				(2.40)		(2.40)	
aty.	125	109	35				
	(4.13)	(2.60)	(2.75)			791	
No. of HH		9	5		(11.71)	(53.91)	
		(3.61)			3	55	
Debligad		7 to 11 ful 1 2	\~.•\/.!/		(1.20)	(22.09)	a de
Oty.	(1) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			4706		<b>₽</b>	7.0
				(92.61)		217	
No. of HH				211		(50.98)	
				(83.07)		66 755 001	
Bhatnalagad				· ~ * * * * * * * * * * * * * * * * * *		(25.98)	
Oty.	2	_		1		56	
				(50.00)		(3.63)	
No. of HH				1		. 23	
	(0.40)			(0.40)		(9,09)	
aty.	166	148	54	5271.5	62.7	d a set se	•
	(2.07)	(1.46)	(1.35)	(84.27)		1:24	
OTAL No, of HH	177	15	10	266	(6.98) 4	(21.14) 150	
	(0.87)	(0.78)	na na sangan tahun 1990 tidak biga berm	Acres Sarah Sarah	. 그 그 . 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	化性性分析 化二氯甲基酚基苯甲基甲甲酚亚基丁	- 277

Figures in brackets represent percentages: (a) in the case of quantity of total production and (b) in the case of households of all landowning households.

RELATIVE PERFORMANCE OF HORTICULTURE IN DIFFERENT AGRO-CLIMATIC REGIONS OF INDIA: A Case Study of Mango Crop

P.N. Pande\*

#### Horticulture

Horticulture keeps a significant place in the economy of our country. Having abundance of good soil and varied geographical and agro-climatic conditions, India is one among a few countries of the world where almost all types and ranges of tropical, sub-tropical and temperate fruits and vegetables are grown throughout the year in one or the other part of the country. Fruit and vegetable growing and their consumption is important for a number of reasons. First of all these crops have a nutritional value that adds to the quality of intake and gives protection against diseases. Further, horticultural crops help in conservation of soil and water as well as environment, generate employment, because fruit cultivation is labour intensive and the production of fruits also creates possibilities to contribute to foreign exchange earnings.

As per available estimated figures, India has about 7.50 million hectares of area under fruits and vegetables which accounts for 65 per cent of the total horticultural crops and about 2.5 per cent of the total cultivated area during 1982-83. As regards the production, India produces

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about 58 million tonnes of fruits and vegetables, out of which the percentage of fruits and vegetables accounts 34.54 and 65.46 respectively.

### Mango

Manço (Magnifera indica L) is considered to be the king of fruits. It is grown almost in the entire tropical region and to some extent in the sub-tropical region also. Mango is grown in the countries to the east of India right up to southern China and the Malayan Archipelago to the western parts of Australia. According to literature this fruit seems to originate in the Indo-Burma region and has in India been cultivated for more than 4000 years. Magnifera indica literally means "An Indian plant bearing mangoes". In the tropics the mango occupies relatively the same position as is enjoyed by the apple in Europe or in North America.

Mango is being cultivated commercially in a number of countries of the world with an estimated annual production of about 15000 thousand tonnes. India alone contributes about 66 per cent of world production of mango. There are nearly 1000 varieties of mango in India. Of these, however, only about 20 varieties are grown on a commercial scale. Mango alone accounts for about 42 per cent of area and 39 per cent of total production of all fruits produced in India during 1984-85.

Mango fruit is utilized at all stages of its development both in its immature and mature stages. Raw fruits are used for making chutney, pickles and drinks. The ripe fruits besides being used for desert are also utilized for preparing several products like, squashes, syrups, nectars, jams and jellies. The production of different fruits in 1981-82 was estimated at about 21417 thousand tonnes in India. Of this mango is the single largest crop with its production equivalent to about 40 per cent of total fruit production (Table-1). In India, mango occupies 42.6 per cent of the total area under fruits comprising of 0.94 million hectares with a total production of 8.21 million tonnes. The average yield of mango per hectare in India is estimated at about 8.8 tonnes.

Table-1: Estimated Area and Production of Fruits in India 1982-83

	Ar	aa		Product	ion
Name of fruit	(000 Hect.)	Percen- tage of total	(Tonnes '000)	% of total	Per 'Ha.,
Mango	1022	40.1	8834	39.0	8.6
Benana	318	12.5	5608	24.8	17.6
Citrus	235	9.2	1808	8.0	7,7
Guava	156	6.1	1350 ,	6.0	8.7
Apple	162	6.3	967	4.3	6.0
Pine Apple	, 87	3.4	67 2	3.0	7.7
Grapes	12	0.5	237	1.1	19.8
Others :	561	22.0	3186	14.1	5.7
IO TAL	2552	100.0	22661	100.0	8.9

Source: Govt. of India, Ministry of Agriculture Crop Unit II, Department of Agriculture and Cooperation, New Delhi and Agricultural Situation in India, Sept. 1985. The main mango production regions in the world are Asia, and the Central/South America where India is by far the largest producer of mango accounting for almost 63 per cent of total world production (Table-2).

Table-2: World Production of Mango ('000 Tonnes)

Region/Count- ries	1975	1980	198	33 1984	Share in 1984(per- centages)
World	12,664	13,091	13,954	14, 213	100.0
Africa	826	823	836	874	6.1
C/S Amarica	1,955	2,043	2,190	2,123	14.9
Asia	9,942	10,215	10,917	11,204	78 <b>.</b> 8
India	8,500	8,363	8,700	8,919	62.8
Oceania	8	10	11	11	0.1

Source: FAO Production Year Book 1984.

The export of mangoes from our country has been a regular source of foreign exchange earnings. The quantity of mangoes which are exported has been increased by more than 12 times in 1982-83 over 1965-66. Similarly the value of exported mangoes has also been increased by 84 times over the same period of time (Table-3).

Of the total production of mango in India only 0.1 per cent is exported. The total valume of mangoes exported in 1984-85 was recorded 11.750 tonnes at a value of Rs.14.1 crores (Table-4). The main destinations for exports of fresh mangoes are United Arab Emirates, Saudi Arabia and Kuwait and all together having share was about 85 per cent. Of the total export only 5 per cent cent pes to EEC mainly to United Kingdom.

Table-3: Trend of Export of Mangoes from India during 1965-66 to 1982-83

Quantity in Tonnes Value in Thousand Rs. Unit Value Rs. per tonne

Year	Quantity,	Value	Unit value
1965–66	636	853	1341
1966-67	810	1126	• 1390
1967-68	1072	1818	1696
1968-69	1204	2457	2040
1969-70	1408	2956	2099
1970-71	1290	2774	2150
1971-72	1325	2608	1968
1972 <del>-</del> 73	1812	5001	2760
1973-74	1717	5355	3119
1974-75	1619	6835	4222
1975-76	3 906	16141	4132
1976-77	3 4 43	19759	5739
1977 <b>-</b> 78	3369	30192	9190
1978-79	4505	37192	8256
1979-80	4294	46791	10897
1980-81	6692	63259	94 53
1981 <del>-</del> 82	7483	67262	8990
1982-83	8043	67400	8380

Source: Agricultural Situation in India, September 1985, Page 511.

Table-4: India's Export of Mango Based Products

Quantity in tonnes Value in thousand Rs. Unit value in Rs. per tonne

그렇다 전 얼마를 잘 나왔다고 하셨다면 하다			
Year	Quantity	Value	Unit value
1967-68	4986	12646	2536
1968-69	5138	13812	2688
1969-70	10931	23575	2157
1970-71	8950	21198	2368
1971-72	9054	21425	2366
1972-73	13438	31918	2375
1973-74	8318	26160	3145
1974-75	6622	29496	4454
1975-76	10108	44224	4375
1976-77	13923	69530	4994
1980-81	16250	107131	6593
1981–82	26632	142450	5348

Source: Agricultural Situation in India, September 1985, Page 512.

Similarly export of mango based products are also being made from our country. At present our country exports the mango based products worth of Rs.14 crores annually. The export quantity of mango based products has been increased by more than 6 times and the value of export quantity has also been increased by 11 times from 1967-68 to 1981-82.

The present paper is the part of research study entitled "Fruit Processing Industry in India" in which the detailed survey of mango growers was also conducted. The study was carried out by the Giri Institute of Development Studies, Lucknow in collaboration with Development Research Institute, Tilberg,

the Netherlands. The objective of mango growers survey was to examine the economics of mango growing in terms of production level, productivity, cost structure, return, marketing, income and employment. The survey work of the study was carried out during June-August 1987. For the detailed survey of mango growers, the sample units were taken from the main mango growing States in India. The four States viz, Maharashtra, Gujarat, Uttar Pradesh and Karnataka were selected and the districts among the States were, Ratna Giri and Sindhu Durga in Maharashtra, Valsad in Gujarat, Lucknow in U.P. and Kolar in Karnataka.

The total number of mango growers was 901 in the sample from all the selected areas. The sample of mango growers was taken from all the size-groups of orchards. For the purpose of this paper the analysis of survey data have been made according to different agro-climatic zones prepared by the Planning Commission. On the basis of different agro-climatic zones, India has been divided into 15 broad agro-climatic zones based on characteristics of soil, topography, climate, rainfall and water availability. The new concept of agro-climatic zones has been worked out for resource based balanced regional planning. The rationals of this new approach lies in assessing regional potential and problems and evolving development strategies and programmes suited to local resource endowment and needs of the farmers.

The study of mango-growers in the research project was undertaken in the following four agro-climatic regions of the country:

- 1. Western Plateau-Hills Region
- 2. Gujarat Plains-Hills Region
- 3. Middle Gangetic-Plains Region
- 4. Southern Plateau-Hills Region

The distribution of mango growers in the sample among the selected agro-climatic regions was 21.98 per cent from Western-Plateau-Hills Region, 27.75 per cent from Gujarat Plains-Hills Region, 27.85 per cent from Middle Gangetic-Plains Region and 22.42 per cent from Southern Plateau-Hills Regions. According to the area of orchard size, 62 per cent of mango growers in the sample had area under orchard less than 3 acres each. The mango growers constituted 8.00 per cent in the total sample who had orchards more than 10 acres each (Table-5).

The family members of the mango growers in the sample area were engaged in different activities. Taking all the sample households together, it was found that fruit cultivation was the major source of their annual income which contributed 66.73 per cent of the total household income. In Western-Plateau-Hills Region, income from fruit cultivation contributed 68.05 per cent in the total household income, whereas this figure was 59.13 per cent in Gujarat Plains-Hills Region, 70.73 per cent in Middle-Gangetic-Plains Region and 65.34 per cent in Southern Plateau-Hills Region.

The survey data indicated that per grower average area under mango trees was recorded 3.6 acres and it was highest 4.5 acres in the Southern Plateau-Hills Region and Western

Table-5: Agro-Climatic Regionwise Distribution of Sample Mango Growers

According to Their Orchard Size

Area under		Agro-climatic zones	C zones		
Orchard (Acre)	Western Plateau-Hills Region	Gujà Hill	Middle Gange- tic-Plains Region	Southern Plateau- Hills Region	All Regions
Less than 1.00	31 (15.7)	19(7.6)	35 (13.9)	25(12.4)	110 (12.2)
1.00-1.50	21(10.6)	89 (35.6)	67 (26.7)	22(10.9)	199(22.1)
1.50-3.00	45 (22.7)	86 (34.4)	69 (27.5)	48 (23.8)	248 (27.5)
3.00-5.00	34 (17.2)	34 (13.6)	29(11.6)	48 (23.8)	145(16.1)
5.00-10.0	36 (18.2)	19(7.6)	30 (12.0)	42(20.8)	127(14.1)
10.0 and above 31(15.7)	7e 31(15.7)	3 ( 1.2)	21(8.4)	17 (8.4)	/21 8.0)
TOTAL	198 (100.0)	,250 (100.0)	251(100.0)	2.02 (100.C)	901(100.0)

Plateau-Hills Region (Table-6). The average area under mango was lowest 2.1 acres in Gujarat Plains-Hills Region and followed by 3.7 acres in Middle Gangetic-Plains Region. Similarly, per acre number of mango trees were also found in Southern Plateau-Hills Region where per acre number of mango trees were recorded 33 (Table-6).

Table-6: Area under Mango and Number of Mango Trees in the Households of Sample Orchardists

Agro-cli- matic zone	Area under orchards (acre)	der man-	no.of	wer area	Per grow- wer no.of trees	Per acre no.of trees
Western Plateau- Hills	1065.97	894.02	38814	4.5	196	43
Gujarat Plains-Hil	ls 531•65	516.76	16856	2.1	67	33
Middle Gan getic-Plai		921.06	66656	3.7	267	72
Southern F teau-Hills	이 살이 그는 경이를 다 먹는데 하는데 하는데 하는데 하는데 그렇다니다.	912.45	85114	4.5	421	93
ALL Zones	3433.06	3244.29	207440	3.6	230	64

## Mango Production in the Same Orchards

Generally, the level of mango production depends on quality of soil, mango variety, age of tree, use of inputs (irrigation, fertilizer, pesticides), method of cultivation, lookafter and attention towards the orchards. Natural factors, like rainfall, storm, hail and diseases also play a crucial role in determining the production level of the fruits, particularly the mango. The total area under mango trees was 3244.29 acres in all the sample areas. The total number of mango trees

in the sample areas were accounted 207440, claiming per grower 230 trees and per acre 64 trees (Table-6). It is observed that the level of mango production in the sample area was below the national average. Taking all the mango trees together it was found that the total production of mangoes was 7097693 Kgs., registering 2188 Kgs. per acre and 34 Kgs. per trees (Table-7).

Table-7: Agro-climatic zonewise per acre and per tree mango production of sample growers

Agro-clima- tic zone	Area und mango-tr (acre)	the contract of the contract o	Total/qt of mango produc- tion(Kg:	wer ma	ango acre - mang (gs.)prod tion	tree o mango uc- pro-
Western Plai	.n- 894.02	38814	1197881	6 <b>°</b> 50	1340	31
Gujarat Plai Hills	ns- 516.76	16856	1330134	5321	2574	79
Middle Gange tic-Plains	 921 <b>↓06</b>	66656	1999593	7966	2171	30
Southern-Plateau-Hills ALL ZONES	912•45 3244•29	85114 207440	2570085 7097693	12723 7878	2817 2188	30 34

When we examine the production level of mangoes in different agro-climatic regions, we find that there has been differentials in the level of mango production among the agro-climatic zones. Due to per acreoptimum number of mango trees and favourable natural conditions, per acre mango production was recorded highest 2817 Kgs. in Southern Plateau-Hills region followed by 2574 Kgs. in Gujarat Plains-Hills region (Table-7). Per acre mango production was 1340 Kgs. in Western Plateau-Hills region (which was towest among all the regions) and 2171 Kgs.

in the Middle Gangetic-Plains region. In Gujarat Plains-Hills region, per acre mango production was recorded to be higher than other regions because per acre use of fertilizer, pesticides, irrigation and mandays was highest in one hand and the proportion of mango trees in the matured age-group was also highest on the other. Due to lack of irrigation and low use of pesticides, in Western Plateau-Hills region, there has been low yield rate of mango production. Data pertaining to agro-climatic zone-wise per tree mango production revealed that there has been variations in per tree mango production among the regions. Per acre variation in production was perhaps due to the distribution of mango trees in different agegroups. In Western Plateau-Hills region, per tree mango production was 31 Kg., which was below the average of total sample areas (Table-7). The production of mango was recorded at a lower rate in the orchards where the proportions of mango trees were higher in the age group of below 5 years, and more than 50 years.

The analysis of data regarding the level of production in different sizes of orchards indicated that per acre as well as per tree mango production was recorded comparatively higher in the orchards which were smaller in sizes than in the orchards of big sizes. Per grower and per tree mango production have sown a negative relationship with the size of orchards. Per tree production was recorded 77 Kgs. in the households which had orchards upto 30 trees, where-as it was merely 22 Kgs. in the orchards with more than 1000 trees. The orchard size-wise

production trend highlights the fact that orchardists when have lower size of orchards might have given due attention towards orchards as well as necessary inputs might have applied at a optimum level. Per acre number of mango trees were found optimum in the orchards of small growers and the density of the trees in the orchards of bigh orchardists was comparatively much more which explain that the plantation of mango trees was made unscientific in big size of orchards. Although mango production increases in the trees year by year upto the age of 50 years. The agro-climatic region-wise figures related to per tree production in different age groups varied from one region to another. The variation was perhaps due to climatic conditions of area and varieties of mango trees grown by the sample growers.

It was observed that some of the varieties start to give production from their early age and some have their long life. The yield rate of mango trees was recorded about 44 Kgs. among the trees in the total sample which were above 50 year of age. Among the agro-climatic regions, the yield rate in this group was found highest 83 Kgs. in the Gujarat Plains-Hills region. This may be due to particular varieties of mangoes grown by the growers and better use of inputs in the orchards. However, the mango growers in Gujarat plains-hills region did not report any production from the mango trees which were less than 5 years of age. In this age-group, the yield rate of mango was found highest 15 Kgs. in Southern Plateau-Hills region among all the sample regions.

# Production Cost in Mango Cultivation

In analysing the cost structure of mango cultivation in the study we have included the only expenditure involved in various inputs and other costs during the reference year 1986. The total cost (current) incurred in mango cultivation was accounted Rs.6439941 taking all the sample together, indicating per acre cost Rs.1985 (Table-8). When we analyse the data according to different heads of cost we find that the expenditure in fertilizer and pesticides constituted 20.09 per cent and 21.99 per cent respectively in total production cost. Packaging ranked the third major head which required 18.09 per cent of the total cost in the mango production. Expenditure on transport of mango fruits from orchards to markets accounted 14.20 per cent of the total cost.

Agro-climatic zone-wise figures regarding the cost of mango cultivation revealed that the per acre cost in mango production was recorded highest R:3057 in Gujarat Plains-Hills region, followed by Rs.2601 in Middle Gangetic-Plains region (Table-8). In Southern Plateau-Hills region, the per acre cost was lowest Rs.552 which was followed by Rs.2195 in Western Plateau-Hills region. The variation in per acre cost as observed in the sample growers was due to different price levels of various inputs used and the level of their utilization. In Western Plateau-Hills region, fertilizer was recorded a major item of expenditure which alone constituted about 30 per cent of the total cost in the sample orchards of the region. In the case of Gujarat Plains-Hills region, pesticides was appli-

Table-8 : Agro-Climatic regionwise running cost of Mango cultivation in Sample Households

TOTAL	Otners	Fertilizer Pesticides Watering Rent Harvesting Packaging Transport		Head of Cost
100.00	1 8	29.57 17.14 4.33 0.99 6.38 16.87 20.62	Percent- age dis- tribution of total cost	Western Hills Re
2193		648 376 95 22 140 370 452	Per acre cost (ks.)	n Plateau- Region
TOO. OO.		31.76 36.83 9.23 0.03 5.56 4.51 6.20 5.88	Percen- F tage dis- tribution of total cost	Gujarat Plai Hills Region
(	3057	971 1124 282 1 170 138 189 189	er acre cost (Rs.)	ns
	100.00	3.90 14.99 8.30 6.77 4.21 31.85 16.83 13.17	tage edistri- of to- tal cost	Middle Gange- tic Plains Region
	2601	102 390 216 176 109 828 438 342	eare cost (Rs.)	nge-
	100.00	27.75 1 26.19 1 4.55 2.90 0.21 1.82	ye ; stri- total	
	552	153 145 25 16 10		la
	100.00	21.99 8.72 3.18 5.10 18.09 14.20 7.63	tage distri- bution of total cost	All Regions
	1985	436 173 63 101 359 282 151	acre cost (Rs.)	)ns Per

Note: Cost includes the expenditure on material and wages also.

ed at a higher rate and the expenditure involved in posticides constituted about 37 per cent of the total production cost in the region. Whereas in Middle Gangetic-Plains region, the expenditure incurred in packing was highest and it alone accounted about 32 percent of the total mango cost of production. The expenditure on fertilizer also constituted about 36 per cent in the total production cost in Southern-Plateau-Hills region. Better use of active inputs in orchards seems one of the factors in Gujarat Plains-Hills region which led highest yield rate in mango cultivation.

Looking at per acre cost in mango cultivation in different sizes of mango orchards, it was found that per acre production cost of mango varied among the different sizes of orchards. Per acre cost on mango production had indicated a decreasing trend as the size of orchards increases.

### Net Return from the Mango Orchards

After examining the production pattern and cost structure of mango production in the orchards of sample mango growers, let us analyse the net return from the orchards. The viability of mango cultivation is reflected by the net return earned from the orchards. Data pertaining to the net return from the cultivation of mango fruits in the sample regions indicated that net return from mango cultivation was very significant. Per acre net return from mangoes was estimated Rs. 5902 in the orchards of all sample growers (Table-9). The individual agro-climatic zones have shown a wide range of variation in

Table-9: Agro-Climatic Region-wise Cost, Production, and Return from Mango fruits Among the Sample Mango Growers

Agro- Climatic	Area un- der man-			Production value (Rs.)		Net Return (Rs.)	
Zone	go(acre)	Per acre	Per tree	Par acre	Per tree	Per acre	Per tree
Western Plateau- Hills	894.02	1949	45	9245	213	7296	168
Gujarat Plains- Hills	516.76	3148	97	8571	263	5423	166
Middle Ga getic Plains	n- 921.06	2752	38	8944	124	6192	86
Southern Plateau- Hills	912.45	586	6	5126	55	4540	49
ALL REGIONS	3244.29	1985	31	7894	123	5909	92

per acre return from mango trees. Per acre net return from mango orchards was recorded highest Rs.7296 in Western Plateau—Hills region and lowest Rs.4540 in Southern Plateau—Hills region. In Southern Plateau—Hills region, per acre cost as well as value of production was also lowest among all the sample agroclimatic zones. In Western Plateau—Hills region, per acre value of mango production as well as return was found highest because the variety (Alphonso) of mango is a superior variety which fetches highest price and has a great demand in the market. In the case of Southern—Plateau—Hills region, the varieties which were grown by the sample growers were not in good quality from the point of view of taste and did not attract

higher prices. Per tree net return from the mango orchards was also recorded highest Rs.168 in Western Plateau-Hills region and followed by Rs.166 in Gujarat Plains-Hills region (Table-9). It was also observed that per acre as well as per tree return from mango varied from one size-group of orchard to another.

# Pattern of Employment in Mango Cultivation

The performance of any aconomic activity is also measured by employment level. In our sample areas, no grower had used any kinds of mechanical power during any operation of mango cultivation, except for the purpose of transportation of the fruits. Human power was solely utilized for all the operations in mango cultivation and growers had used their family members and workers from outsides to perform the work in orchards. The employment pattern in the orchards indicated that family labour was absorbed at a higher rate in small orchards as compared to big size of orchards. Taking all the sample orchards together, per acre employment rate in mango cultivation was recorded 140 mandays. Among sample agro-climatic zones, per acre employment varied from one ragion to another. Per acre employment rate was recorded highest 355 mandays in Gujarat Plain-Hills region (Table-9). Though per grower area under mango in the State was lowest (2.07 acres) among all the sample regions, but it was found that production (79 Kgs. per tree) as well as employment rate was recorded highest in Gujarat Plains-Hills region. Southern Plateau-Hills region ranked lowest as far as



per acre employment rate is concerned. Per acre employment rate was found 124 man-days in Western Plateau-Hills region and 91 man-days in Middle Gangetic-Plains region (Table-10). The proportion of mandays from family members of the growers in total employment was worked out 36.83 per cent in the total sample orchards. Region-wise figures regarding the proportion of employment from the family members of the growers was found highest 53.63 per cent in Middle Gangetic-Plains-region followed by 45.25 per cent in Southern Plateau-Hills region. It was 24.55 per cent in Western Plateau-Hills region and 34.53 per cent in Gujarat Plains-Hills region.

Mango production also depends on natural and unnatural factors to a great factors. Due to natural calamities, such as heavy rains, storm and hails, sizeable portion of mango fruit is destroyed in every year. A significant proportion of of each mango growers in the sample/agro-climatic zone had reported pre-harvest losses on account of fruit drop. More than 76 per cent of the growers had reported that they had suffered from pre-harvest losses in mango production on account of fruit drop. The data regarding the fruit losses among the mango growers in the different agro-climatic zones indicated that the proportion of mango growers recorded highest in the Gujarat-Plains-Hills region followed by Middle Gangetic Plains region. It was recorded lowest in Western Plateau-Hills region followed by Southern Plateau-Hills region. Apart from natural

Table-10: Employment Pattern in Mango Cultivation

ALL REGIONS 177846 1570	Southern Plateau- Hills region 35251 -	Middle Gargetic- Plains Recion 44905 180	Gujarat Plains- Hills region 65125 965	Western Plateau- Hills region 32565 425	Agro-Climatic Own Others family (mandays) days)
179416	35251	45085	66090	32990	days Total (man- days)
245000	41160	17920	101080	84840	Regular employ- ment (man- days)
58477		20725	21425	14844	Casual amployment (man-days)
4282893	77896	83730	1885.95	132674	Total employ- ment (man- days)
140	85	91	ស ស ស	124	Per acre employment in mango culti- vation (man- days)

calamities, a sizeable portion of mango production goes waste at the time of harvesting, grading, transportation and marketing. Data pertaining to losses by way of different reasons indicated that 25.86 per cent of the total growers had reported losses of mango production during the process of transportation of mango orchards to markets. The proportion of mango growers who reported any fruit loss during transport was 40.52 per cent among the growers who had sold their mangoes in the markets. In India, the strong storm and hails generally occur during March to May which is the period of mango flowering and the early stage of its fruiting. Middle Gangetic-Plains and Southern Plateau-Hills region have shown losses of mango fruits from natural calamities at a higher percentage by greater number of growers (Table-11).

Table-11: Agro-Climatic Ragion-wise Losses of Mango During Transport

(Growers in percentages) No. of Mango Percentage of waste growers growers Agro-15-19 20 and reported Upto 9 10 - 14in the Climatic above sample wastage Zone Western Plateau-16.67 75.00 8.33 198 12 Hills Gujarat Plains-7.96 92.04 176 Hills 250 Middle Gangetic-91.17 8.83 Plains 251 34 Southern Plateau-Hills 202 100.00 11 ALL REGIONS901 88.42 . 11.15 0.43 233

### Marketing of Mango

Some of the fruits mango, citrus, apple, guava, etc. are sold usually by the cultivators on the basis of area to the pre-harvest contractors at the time of flowering of the trees. Only few orchardists attempt to sale the produce by taking it to nearby markets. Both types of sales have got advantages and disadvantages. Some orchardists sell their fruits in the orchards after harvesting. Besides marketing costs like transporting, transportation loading, unloading, commission charges, etc. the self marketing system has to bear additional expenditure towards items like watch and ward, harvesting, the plant protection measures at the orchards which are generally borne by pre-harvest contractors.

The way in which mango is marketed at present all over the country is unsatisfactory, with the result that a large quantity of these fruits are spoiled in transit due to bad packing and rough handling. Mangoes pass through many hands before reaching the place of sale. Usually, mango orchards are at a quite distance from markets and in current system of marketing, fruits take a long-time to go through various stages after harvesting before they reach the consumer. There are sound reasons why the grower can not easily overcome from these difficulties such as the long distance between orchards and wholesale markets, lack of quick means of transport and cold storage facilities and absence of cooperation and fair dealing between growers and agents in the market. Ignorance of market and marketing conditions also compels growers to

sell their produce to the contractors in order to avoid all the risks.

Mango is basically grown for commercial purpose, therefore, marketing of mangoes plays a significant role in determining the level of return and incentive to growers. The sample growers had sold their mango production through different marketing arrangement. Sale at farm constituted 51.78 per cent of the total quantity sold by the growers and rest was (Table-12) sold in the markets. Sale at farm constituted pre-harvest sale and spot-sale. It is found that pre-harvest sale was recorded at a relatively higher proportion of the total sale done at the farm and it accounted 68.55 per cent of the total sale at farm. Spot-sale is made generally after harvesting. Contractors were the sole agents for purchasing the mangoes of sample growers at pre-harvest stage.

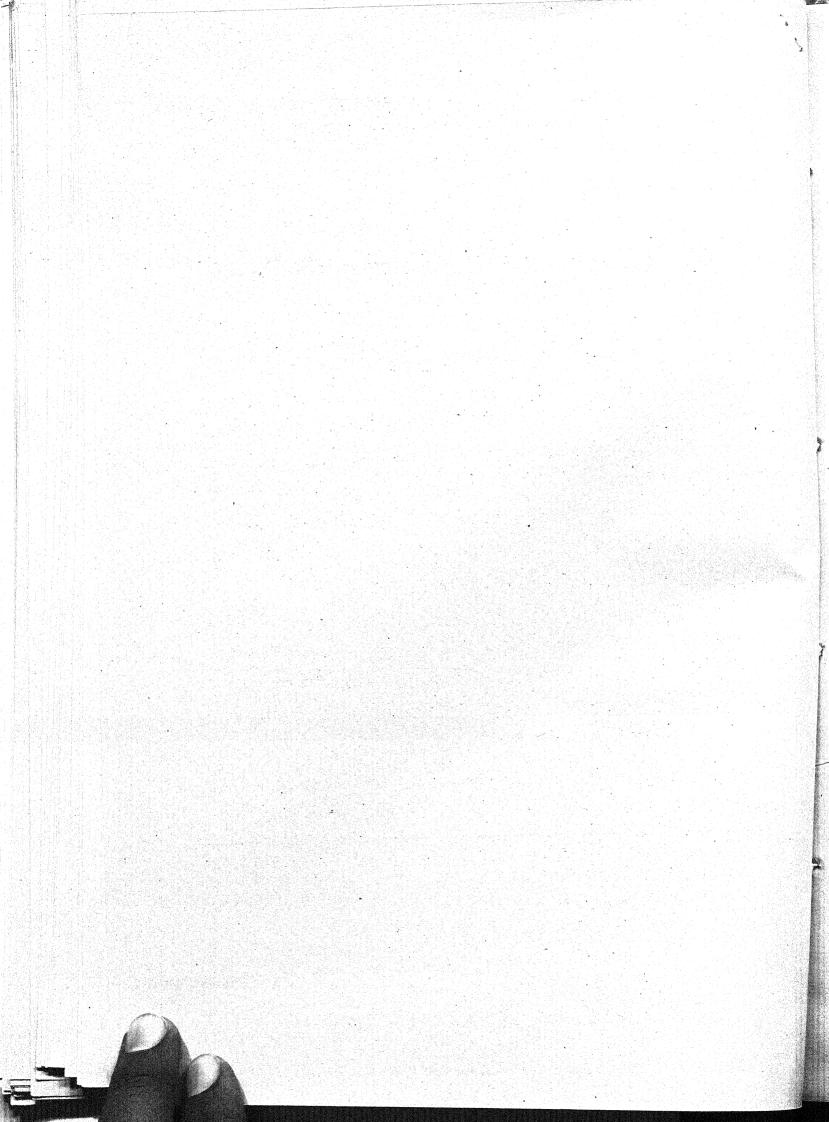
There are several agents to whom the growers in the sample had sold their mango production in the market. Out of total quantity of mango which was sold by the sample growers, 48.22 per cent was sold in the markets and rest was sold at farm. In the market wholesalers were the main agents to whom 93.33 per cent was sold out of total quantity sold in the market.

The pattern of mango sale was not similar among the growers in all the agro-climatic regions. Among the agro-climatic zones, the proportion of sale at farm in the total sale was found highest 92.63 per cent in Southern Plateau-

Hills region and lowest 5.61 per cent in Gujarat Plains-Hills region. In other regions such/Western Plateau-Hills and Middle Gangetic-Plains, the proportion of mangoes which was sold at the farm was recorded 48.48 per cent and 31.22 per cent respectively. The distance of market, market conditions, availability of transport facilities and road links are the major factors which determine the sale arrangements of mango fruits to a great extent. Data regarding the pattern of sale at farm indicated that more than 68 per cent quantity was sold at preharvest stage out of the total quantity sold at farm. In the individual agro-climatic regions, it was found that preharvest sale constituted 100.00 per cent in the quantity sold at farm by the sample growers in the Gujarat Plains-Hills region. Pre-harvest sale accounted 59.30 per cent of the total sale at farm in Southern Plateau-Hills region, 70.00 per cent in the Western Plateau-Hills region and 99.82 per cent in the Middle Gangetic-Plains. Sale at spot constituted more than 40 per cent in the total sale made at farm in the Southern Plateau-Hills region. In the case of quantity sold in the market, it was found that wholesellers have been the main buyers of mangoes in the sample areas and it was recorded that 93.33 per cent of the total quantity sold in the market was sold out to wholesellers. In the Southern Plateau-Hills region wholesellers were the sole buyers in the market. processors had been the second agents to whom 5.58 per cent quantity was sold in the market. In the Gujarat Plains-Hills region, 12.29 per cent mangoes out of total quantity sold in market were sold out to the processors (Table-12).

Table-12: Pattern of Mango Sale Among the Sample
Mango Growers

					THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER, THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER, THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER, THE PERSON NAMED IN COLUMN TO THE OWNER,	CARGINGS CATAGORD STANDS OF THE STANDS AND STANDS	The reserve specifical and private substitute sections of the section of the sect		
		U•43	3127074 93.33 (100.00)		31.35	68,65	3358053 (100.00)	6485127	ALL REGTONS
л , л ,	ا ا	) ง	Company of Company (Company of Company of Co			A STATE OF THE PARTY OF THE PAR	/00.00/		
1	•	1	178000 100.00 (100.00)		40.70	59.30	2	3 <b>-</b> 2430850	Southern Pla- teau-Hills
3 <b>.</b> 04	0.11	0.63	1316966 96.33 (100.00)		0,18	99.82	597635 (100.00)	1914601	Middle Gançe- tic Piains
12 <b>.</b> 29	1.77	0. 54	970578 85.40 (100.00)			100.00	57650 (100.00)	ns- 1028228	Gujarat Pleins- Hills
0. 90			661530 99.06 (100.00)	~ 0	30.00	70.00	449918 (100.00)	1111448	Western Pla- teau-Hills
							ta m		Barrier Commission Com
8 0 C C C	ler sumer ssors	ler	Quantity Whole- sold in seller market	m S	Spot sale	y Pre- y harvest	tit	Total qty. sold	Agro-Climatic Zone
Drona.		Market	Sale in	CATAMATA AND SECTION OF SECTION O	And the second of the second o			THE RESIDENCE OF THE PROPERTY	PROPERTY OF THE PROPERTY OF TH
e , many manual approximation	CONTRACTOR CONTRACTOR EXCENSION STATE OF	tages)	sale in percentages)	(Quantity					
			The second secon	And the second s	Growers	Mango			



REGIONAL DEVELOPMENT THROUGH AGRO - PROCESSING INDUSTRY :
A Case of the Khandsari Industry in U.P.

# A. JOSHI\*

Economic development, by its very nature, is a dynamic process characterised by various types of imbalances. where is this more striking than inthe spatial dimension of growth. Growth generally tends to get concentrated in certain regions. Regional disparities in development, particularly industrial development, is thus a serious problem experience in all countries especially the developing ones. The disparities between regions creates imbalances in employment as well as income. India is a late starter in industrial development. Although it has achieved some success in this field, industrial growth has got concentrated in certain states and in a few selected centres. Uttar Pradesh, is among the lesser developed states. Even within the state one observes that the Western region is far more developed as compared to the remaining four regions of the state with respect to industrial development as well as agricultural development.

Industrialisation, as we know, is a key factor in raising the levels of economic development, providing employment,

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This paper has utilised some information from the project
report "A Survey of Khandsari Industry in U.P." recently
completed by A. Joshi and G.S. Mehta.

raising incomes and for improving the overall standard of living of the people. This is so since most of the people in developing countries generally remain engaged in agriculture Thus their life is closely connected with the utilisation of natural resources constituting the basis of agricultural production. However, agriculture alone is incapable of solving the developmental needs of a region or the entire needs of the people. In fact, beyond a certain point even agricultural development is dependent on industrial development. Agriculture has obvious limitation in the sense that the land area is fixed and so with the rise in population any extra burden on land resources causes problems of over and under employment and land productivity begins to get adversely affected. Thus the additional man power has got to be diverted to sectors outside agriculture beyond a certain point. Moreover, agriculture itself is dependent on the industrial sector for its growth. On the one hand agriculture, with modernisation, makes increasing use of industrial products as key inputs in the production process. This may be in the form of chemical fertilizers, pesticides and a wide range of agricultural machinery. On the other hand, it produces various products which are utilised by various industries in their own manufacturing process. A long list of such agro-based industries can be thought of in this connection. Thus agriculture and industry both play a vital role in achieving overall development of any region.

There was a time when the industrial sector was heavily dependent on agricultural and other natural resources. Times have changed and the relative importance of the agricultural sector in providing inputs to the industrial sector has declined considerably with the advent of the modern manufacturing sector which utilises a wide range of intermediate products produced by the industrial sector itself as the key inputs in production. However, even today there are industries which depend on the agricultural sector and so the significance of agro-based industries continues particularly where such a high proportion of the workforce is engaged in agriculture.

In the context of regional development it could be quite effective to utilise agricultural products to achieve economic development particularly in areas where the modern industries are not being attracted with case. This would provide the much needed incentive to the agricultural sector and also strengthen the industrial base of a region. As far as the people of the region are concerned this will have far fetching results. The cultivators will find a ready market for their produce and the workforce will be able to find gainful employment if the units are located within their region. In this way the levels of living will improve. These agro-industries need not be large units. Even small scalesector industries would serve a fruitful purpose.

It is not possible to discuss a number of such agrobased industries together. The present paper, therefore, aims at focusing attention on one such industry which utilises agricultural produce and can easily be set up even in rural areas. Thereby contributing towards industrial development, employment and income generation and also provide adequate incentive to the cultivator. We shall now briefly see how the Gur and Khandasari industry can play this role.

Sugarcane, as we are well aware, is an important cash crop of the state and is extensively grown in the Western, Central and Eastern regions of Uttar Pradesh. It, therefore, plays a significant role in the agriculrual economy of the state. The major concentration of sugarcane cultivation is found in the western region. The area under sugarcane in the state between 1974-75 and 1989-90 depicts a fluctuating trend. In 1974-75 it was 14.91 lakh hectares while it was 17.55 lakh hectares in 1989-90. The intervening years have witnessed fluctuations with the lowest area being 13.63 lakh hectares in 1980-81 while 1987-88 had an all time high of 18.00 lakh hectares under sugarcane. However, productivity has been going up steadily over the years despite the fact that some fluctuations are observed. Thus productivity has gone up considerably from 412.19 quiltals per hectare in 1974-75 to 553.44 quintals per hectare in 1989-90. As a result of the increased productivity total production too has registered a substantial increase from 6147.92 lakh quintals in 1974-75 to 9712.77 lakh quintals in 1989-90 (Table I).

The process of Khandsari manufacture is very old. In the early stages khandsari was produced through a rather slow and laborious process as a result of which the sugar obtained was powdery and yellowish. Moreover, the sugar recovery was very Between 1936 and 1948 the Gur and Khandsari Scheme of poor. Billari was instrumental in developing a new process known as open-pan sulphitation process. This method improved the quality of sugar produced as well as the recovery rates. In fact khandsari sugar produced by some of the efficient units today is so good that the ordinary person can not distinguish it from mill made sugar. However, even this improved method can not match either the quality or the recovery rates of the modern sugar mills which use the vacuum-pan process. The other fact is that despite the better quality as well as higher recovery of the open-pan sulphitation process, less than half of the total units during 1989-90 were sulphitation units. This is probably so because the cost of the plant is relatively higher. During 1989-90 a new sulphitation unit was priced at around Rs. 14 lakhs.

The khandsari units classify as small scale industries and a large number of these units in the state are registered under the factories Act. There are two main crusher sizes which are prevalent in the State. The smaller size with a 10 inch x 12 inch crusher has a crushing capacity of 4 tonnes per hour while the 13 inch x 18 inch crusher has a capacity of around 10 tonnes per hour. As has already been indicated, khandsari is manufactured through two processes. The traditional or the non-sulphitation method and the open-pan sulphitation method. The former process is a single process

through which around 5 Kgs of khandsari and 6 Kgs of khandsari molasses is obtained for each quintal of sugarcane crushed. The sulphitation method, on the other hand, is a three stage production process. It is much more efficient and produces 7 Kgs of khandsari and 4 Kgs of khandsari molasses for every quintal of sugar cane crushed. While these are the average recovery rates of the two types of methods, considerable variations are found between individual units. The main crushing season generally begins around October and extends till the end of May.

A look into the time series data of the Gur and Khandsari units of the State reveals that there has been a distinct declining trend in the total number of units over the past 15 years in general and since 1980-81 in particular. Thus there were as many as 3500 working units in 1975-76 but in 1989-90 this number had reduced to 1552. However, what is interesting to note is that despite the declining trend in the total number of khandsari units the total quantum of sugarcane crushed has increased quite considerably over the years. In fact during 1975-76 only 550.20 lakh quintals of sugarcane was crushed in the khandsari units of the State whereas the figure for the year 1989-90 was to the tune of 1119.93 lakh quintals. As an obvious result of the increased quantity of sugarcane crushed the production of khandsari has gone up substantially over the years (Table II).

Not only is this industry important from the point of view of number of units but important even from the point of view of providing employment. According to the Annual Survey of Industries, Uttar Pradesh (brought out by the Economics and Statistics Division

of the State Planning Institute), 80124 persons were employed in the Khandsari industry of the State during 1985-86. It is, therefore, quite evident that the industry not only plays a crutial role in utilising sugarcane produced by the cultivators but is also providing gainful employment to a fairly large number of persons. These units are mostly located in the rural areas so employment is mainly being provided to the rural workforce. Thus, despite the fact that the industry is a traditional one and has a low recovery rate, its significance remains on the grounds of its employment generating potential in the rural areas. The khandsari industry also assumes importance on the ground that out of the total sugarcane produced in the State around 17 per cent is set aside as seed and for on farm consumption. Another 33 per cent was crushed in the modern large scale sugar mills of the State in the year 1989-90. This leaves a balance of 50 per cent. During the year 1989-90 around 11.5 per cent of the total sugarcane produced was crushed in the khandsari units. Thus even if we account for the fact that a few more sugar mills are in line to be set up yet there is ample scope for more khandsari units to be set up.

The khandsari units of the State are very heavily concentrated in the Western region and the units located in this region account for almost 87 per cent of the total units located in the State as a whole. Even within the western region five districts namely Bijnor, Muzaffarnagar, Moradabad, Meerut and Saharanpur togther account for around 58 per cent of the total units and 69 per cent of the total sugarcane crushed by the khandsari units in the State

State. These units are both small and the large sized units. Employment in the smaller sized units in around 50-60 workers whereas the larger units may have employment in excess of 200 workers. This again clearly highlights the fast that although the industry itself may be a traditional one from the point of view of technology, it is still an important one when we look at the employment provided by it and that too in the rural areas. The average daily wages are around Rs. 25 per worker. In order to ensure that the unit does not face problem of labour shortage the labourers are assured of work in the next season as soon as crushing comes to an end. The workers arelocal as well as nonlocal. The non-local workforce comes from Eastern U.P. and Bihar. The entrepreneurs provide the non-local labour train fares when they come at the beginning of the crushing season and again when they return once the crushing period comes to an end.

The fact that the industry is traditional is amply reflected in the fact that the average recovery rate is around 5.5 percent if we take the combined recovery rates of sulphitation and non-sulphitation units. As against this, the average recovery in the sugar industry is around 9.5 percent. Moreover, the cost structure is such that the cost of production is quite high.

A survey conducted of 126 khandsari units of Bijnor, Muzaffarnagar, Moradabad, Meerut and Saharanpur revealed that the average cost of production of these units taken together worked out to be Rs.775 per quintal. As against this the average selling price was Rs.680 per quintal. But there were some

obvious doubts regarding the cost estimates provided by the units and it appeared that they were slightly inflated when particularly with respect to various miscellaneous expenses. However, since these were figures provided by them in their final accounts they had to be taken as such. Even then, despite a higher cost of production, the loss was more than made up by all units through the saleof bye products such as raab, khandsari molasses and badda gur. Khandsari molasses particularly fetches a fairly remunerative price as it is mainly utilised in the manufacture of alcohol and most of it is sold outside the state. The highest percentage of the total sale finds its way to Gujrat, which ironically is a dry state. While the sugar molasses is an excise item and so its prices are regulated, khandsari molasses does not come under the perview of the state excise. The units are, therefore, free to sell it anywhere and at any price except to the distilleries within the state. As a result, while the best grade sugar molasses is sold at around Rs. 36 per quintal, khandsari molasses is rarely sold at less than Rs. 100 per quintal and may fetch even upto Rs. 250 per quintal depending on the supply-demand situation.

It is therefore quite evident that the khandsari industry is certainly playing an important role in the state. First of all it provides a ready market for sugarcane which is the most important cash crop of Uttar Pradesh. Secondly, being a labour -intensive industry, it has ample scope for providing employment opportunities to the labour force. Moreover, it is mainly catering to the employment needs of the rural

population. As it is, employment problem is rather acute in the rural areas and this forces people to migrate from the rural to urban areas leading to various problems in the urban areas themselves. So any industry which can provide employment in the rural areas has own importance. Finally, both gur and khandsari are cheaper substitute of mill made sugar and so they readily cater to the needs of the rural poor as well as the poorer sections of the population residing in the urban areas.

As has been indicated earlier, the western region has taken maximum advantage of the sugarcane grown there by setting up this agro-based industry. In the light of this one feels that a similar situation could have emerged in those-parts of the Central and estern regions of Uttar Pradesh which have facilitated the sugarcane cultivator as well as the rural labour force. It has been pointed out that the khandsari units of the western region are employing workers from the eastern region. Had the eastern region developed the industry, the entrepreneurs would have easily found workers with sufficient experience of working in a khandsari unit. Above all, with a chain of khandsari units, even those two regions recould have improved their industrial base and thereby the khandsari industry could have contributed more significantly towards the regional development.

Over the past two decades the government has not been giving due encouragement to the khandsari industry. As a matter of policy no new licenses are being issued to set up

new khandsari units. The government could reconsider its stand and from the point of view of promoting bahanced regional development, it may issue new licenses at least in the eastern and central regions of the state. Our survey of the khandsari units also brought to light the fact that the entrepreneurs of these units have been pressing their demands to be granted permission to set up mini-boiler plants. They claim that the mini-boiler plants will enable them to achieve a recovery rate of 8.5 percent. One of the reasons for the neglect of the khandsari industry could possibly be on the grounds of its poor recovery as compared to a sugar factory. Thus, if they could be granted permission to instal mini-boiler plants even the recovery angle could be partly care of. Another cause for dissatisfaction among the khandsari entrepreneur is thattwhile all other small scale industries are entitled to the facilities of easy finance, the same is denied to them. In case they too are entitled to finance this may lead to non-sulphitation units getting converted into sulphitation units. This again would help improve recovery rates. Finally, the khandsari units are under the direct or indirect control of numerous government departments. They, therefore, feel that the procedures should be simplified and they should be accountable to fewer departments. These are possibly the some of the reasons which accounts for the declining number of khandsari units in the state over the last 15 years.

Without overemphasising the importance of the khandsari industry, it is evident that employment generation has been

an important problem faced by the state and the khandsari industry has definitely played a halping hand by providing employment to over 80 thousand workers. Besides this it is also sustaining the sugarcane economy alongwith the sugar industry. The state could therefore re-examine its stand with respect to this agrobased industry on these lines rather than merely discard it as a technologically backward traditional industry. Even as of today barely 33 percent of the entire sugarcane produced is utilised by the sugar industry and so there is no need to ignore the khandsari industry. In fact the khandsari industry may be used as a tool for promoting regional development with a special focus on the rural areas.

TABLE - TAREA AND PRODUCTION OF SUGARCANE IN U.P.

Year	Net Area s <b>b</b> wn (lakh Ha.)	Total area under sugarcane	Production of sugar- cane (Lakh	Average yield (Qts.Ha)
		(lakh Ha.)	Qts.)	
1974-75	171.60	14.91	6147.92	412.19
1975-76	172.01	14.40	5835,90	105.08
1976-77	173.75	14.55	6521.55	447.94
19 <b>77–</b> 78	174.21	16.36	7681.86	469.41
1978-79	174.81	16.33	6232,42	381.46
1979-80	169.97	13.72	5122.84	373,17
1980-81	172.21	13.63	6420.49	470.90
1981-82	172.88	16.51	7644.01	462,72
1982-83	172,26	17.82	8138.67	456.55
1983-84	172.73.	13.88	7824.38	463.54
1984 <b>-</b> 85	172.48	15.43	7088.82	459,36
1985–86	172.43	14.89	7303.68	490.19
1986-87	172,32	16.80	8473.63	50 5.09
198 <b>7-</b> 86	171.35	. 18.00	9305.40	516.68
198 <b>9-2</b> -	NA	13.61	8852,27	50 2,60
1989-90	NA	17.55	9712.77	553,44

Source : Directorate of Agriculture, U.P., Lucknow.

DATA RELATING TO KHANDSARI UNITS OF UTTAR PRADESH

			Y			
Year	Licensed Units	Working Units	Sugarcane crushed (1akh qts)	Khandsari Produced (lakh qts)	Gur Produced (1 akh qts.)	Molasses Produced (lakh qts)
1975-76	4077	3500	550.20	23.06	7.51	13.60
1980-81	2875	2636	805.62	33.09	8.15	12.78
1981-82	2813	2501	901.48	45,25	15,53	NA
1982-83	2761	2184	972.72	.48.01	11,39	4,35
1983-84	2374	2041	909.97	39 <b>.</b> 42	14.60	6.54
1984-85	2077	1808	828.81	39.00	10.04	6.16
1985-86	1940	1744	10 21. 27	48.09	23.48	4.08
1986–87	1874	1767	1283.24	66,35	15.56	2,23
1987-88	1815	1666	1254.54	53,05	19.01	6.65
1988-89	1744	1600	1199,33	51.04	20.30	0.69
1989 <b>-</b> 90	1641	-1552	1119,93	51.14	20,65	4.36

Source: Cane Commissioner's Office, Lucknow.

#### Fahimuddin\*

The performance of Indian agriculture in Post Green Revolution period has been remarkably impressive. However, the use of seed · irrigation - fertilizer technology not only remained confined to few limited crops but also spread more rapidly in some areas than others. Hence, the agricultural growth strategy based on new technology with its selective crop area approach created spatial disparities in crops productivity levels across the country. Some areas endowed with higher potentialities of resource base and input use attained bigher levels of per hectare yield than others. No doubt, thanks to the new technology, the areas with lower infrastracture and resource use intensity have also achieved higher growth in per hectare output. However, the differences remained larger and the phenomenon led to the doubts that whether the new package can really bring about alround agricultural growth in the country when the resource base, infrastructure and geo-physical conditions deviate so apparently from one area to another. Naturally the attention got focussed on the areas which were left out of the coverage of new technology vis-a-vis crops. But the considerable gap in crop productivity continued to exist across the different areas.

<sup>\*</sup>Giri Institute of Devalopment Studies, Lucknow

#### Agriculture in U.P. Hills

The hill region is one of the five economic regions of Uttar Pradesh. Situated in the northern part of the state, it comprised of eight districts, viz. Almora, Pithoragarh, Uttar-Rashi, Garhwal, Chamoli, Tehri Garhwal, Dehradun and Nainital. To the north of region lies China, to the east Nepal, to the west Himachal Pradesh and plains of state to the south. Its population according to the 1981 census was 48.36 lakhs and area 51,125 sq. kms. which constituted 4.36 per cent and 17.40 per cent respectively of the total population and area of the state. Agriculture remained the bedrock of the regions economy. Quite descreedly, therefore, the examination of comparative level of agricultural development of the hill regions vis-a-vis other regions of the state continued to be a matter of research among social scientists. An obvious and frequently employed technique has been to compare the level of agricultural development of the hill region with other regions and the state as a whole using certain well known indicators of development like cropping intensity, gross value of agricultural produce per capita at current and constant prices, gross value of agricultural produce per hectare of net and gross sown area and productivity levels of various crops etc. when the values of these indicators were analysed in spatial context, the hill region of U.P. emerged as one of the agriculturally advanced region of state (Table 1.). But the observed level of agricultural development in the hill region was quite unreal

and misleading. Included in the eight districts of the region are two, Mainital and Dehradun which have substantial plain and fertile area and rank among the most developed districts of the state. When the agricultural development of these two districts which have negligible characteristics of a hilly area, are excluded from the other six constituent districts of hill region, the scenario altogether changes. The hill region appears to be one of the agriculturally backward region of the state (Table 2). It is also evident from the disaggregated data placed in Table 2 that despite the exclusion of Nainital and Dehradum districts from the hill region, the cropping intensity in remaining six districts continued to remain highest as compared to all other regions of the state while the level of agricultural development emerged to be least developed there. Thus the six districts which represented hill region of U.F. in the real sense, exhibited a situation in which the crop cultivation was extremely intensive but returns from it were extremely low. Such paradoxical situation indicated that the productivity levels of most of the crops were low in U.P. hills. This phenomenon got support from the data placed in Table 2 which showed that productivity of most of the important crops was far lower in U.P. hill as compared to other regions of the state, Thus, the productivity enhancement of major crops was the most crucial and necessary step in any strategy design to develop agriculture in U.P. hills. The purpose of this paper is to (i) examine the productivity dynamism over a decade in one of the main crops of the U.P.

hills; (ii) identify productivity influencing factors in the present agriculture development; (iii) identify constraints in productivity boost; and finally (iv) suggest suitable policy recommendations to increase productivity in U.P. hills.

#### Materials and Methods

For studying the above mentioned objectives, both secondary and primary data were used. The secondary data regarding cropping intensity and productivity levels of different crops in regional as well as at the inter-district level were obtained from the office of Director of Agriculture, Government of U.P. The secondary information regarding the gross value of agricultural produce per capita and per hectare of gross and net cropped area were taken from the publication 'District-wise Indicators of Development', State Planning Institute, Government of U.P. The analysis of secondary information was disaggregated at district level to exclude Nainital and Dehradum from the list of districts comprising hill region in official records. It was done so because these two districts have substantial plain area and have little resemblence with rest of six hill districts in terms of agricultural development. The idea behind such disaggregated analysis was to present a realistic scenario of productivity levels in hill areas. Paddy crops was choosen as a case to examine because paddy was cultivated on around 25 per cent of the gross cropped area in hill region of U.P. The compound growth rates were worked out by using the following formula:

$$r = \left(\frac{\text{ant.log}}{\text{ond}}\right) - \left(\frac{\text{log po}}{\text{ond}}\right) - 1 \times 100$$

where r is growth rate,  $\sum \log pt = \log x_1 + \log x_2 + \log x_n$ ,  $\sum \log pp = n \times \log x_1$  and  $\sum = n \cdot \left(\frac{n-1}{2}\right)$ 

The factors explaining the variations in paddy productivity were analysed by using the following form of production function:

$$y = ax1^{b1} x2^{b2} \dots xn^{bn}$$

where y is the output per hectare (quintals) and x1, x2 .... xn are the input used. To be more specific, the production function of the following type was fitted:

Log y = Log a + b1 log x1 + b2 log x2 .... bn log xn

The dependent variable considered in the equation is the productivity per hectare not the production. The independent variables are the major inputs like seed, family labour, hired labour, irrigation and fertilizer. The land as an independent variable has not been considered because area may alone explain high variation in productivity and may be highly correlated with other variables. For the estimation of functions ordinary least square method was employed. A simple correlation of coefficients were also worked out to get an idea of association between variables included in the model. The functional relationship analysis was based on the primary information collected from 60 farmers of Almora district, 60 farmers of Tehri Garhwal district and thus 120

farmers in total. These farmers owned land holdings of less than 0.5 ha. to 2.01 ha. and above.

### Findings

## (a) Changes in Paddy Productivity

Paddy is the main kharif crop cultivated by most of the farmers in the hill region. Its yield level varied between 10 to 12 quintals per hectare during 1980-81 to 1990-91. Whereas in other regions and the state as a whole it increased considerably during the reference period. The paddy vield in U.P. hills showed a compound growth of only 0.90 per cent during 1980-81 to 1990-91 as compared to 5.51 per cent. 7.75 per cent, 5.86 per cent, 6.56 per cent and 5.13 per cent respectively in the western region, central region, eastern region, bundelkhand region and the state as whole (Table 3). Moreover, the growth of paddy productivity was also marked by the high degree of intre-regional (inter-district) disparities. While Almora, Pithoragarh and Garhwal showed a growth of less than two per cent, Uttarkashi and Chamoli had a growth rate of less than one per cent. The paddy yield declined by 1.22 per cent in Tehri Garhwal district. Thus during more than a decade, the growth in paddy yield in hill region of U.P. has been negligible.

# (b) Factor - Product Relationship

It is a commonly known fact that the input use and productivity are related to each other and productivity differentials can be explained by the level of inputs used. If the

modern inputs of seed, fertilizer and irrigation have weak relationship with productivity in any agrarian economy, then the productivity levels are bound to be lower. Therefore, keeping in view, the low productivity of paddy in U.P. hills, the simple correlation coefficients were worked out between the productivity of paddy and five main inputs used in its cultivation by the sample farmers of Almora, Tehri Garhwal districts and the results were placed in the following table:

Table 4: Coefficients of Correlation Between Productivity of Paddy and Other Variables of Sample Farmers in Hill Districts.

Variables	Correlation Coefficients				
	Almora	Tehri G <b>ər</b> hwal	Combined		
Paddy seed and Paddy productivity	0.2359	0.3726	0.2336		
Family labour and paddy productivity	0.9580*	0,9469*	0.9499*		
Hired labour and paddy productivity	0.2336	0.2538	0.2487		
Fertilizer and paddy productivity	0.2955	0,3232	··0.3197		
Irrigation and paddy productivity	0.4611**	0,4952**	i 0.4883**		

<sup>\*</sup>Significant at one per cent level

The above table revealed very high and statistically significant correlation between the family labour and the paddy productivity in Almora, Tehri Garhwal and combined level

<sup>\*\*</sup>Significant at ten per cent level.

of both the districts. Other variables though showed positive relationship with the productivity but their relationship was not significant except the relationship of irrigation -productivity which was found to be significant at 10 per cent level. Thus it was evident that at the present level of paddy productivity in hill region, the contribution of modern inputs of seeds - irrigation - fertilizer was not significant enough which resulted in low productivity of paddy.

Since family labour was alone found to be significantly correlated with paddy productivity at the three spatial levels of U.P. hills, this variable was alone considered in regression model first. Later on other variables were also included in multiple regression equations and the results obtained were placed in Table 5. The table revealed that the family labour alone explained about 13 per cent, 14 per cent and 14 per cent of the variations in paddy productivity in Almora, Tehri Garhwal and at both places. It was also found to be statistically significant at one per cent level. But when all the five selected indicators were considered in the regression equations, it was found that except the coefficients of irrigation which were significant at 10 per cent level, non of the variables showed significant relationship and explanatory power of the equation  $(R^2)$  fell down. All the equations, thus, estimated were also not significant statistically.

Keeping this trend in mind, one can infer that in the present paddy cultivation, family labour was one of the most crucial variables for its productivity variations. The irri-



gation was also the important variable but its significance level was low as compared to the family labour. Low coefficients of fertilizer and seed in the estimated equation indicated that farmers in U.P. hills may be unaware of the fact that seed and fertilizer when applied with irrigation can provide substantial yield. They may be satisfied with the assumption that irrigation alone raises productivity.

#### Conclusions and Suggestions

Thus, the above analysis of study of agriculture in U.P. hills and paddy productivity dynamism and factor-product relationship reveals the followings:

- (a) The U.P. hills are one of the agricultural most backward areas of the state. This fact has come out from the disaggregated data which showed considerable inter-district disparities in agricultural development after the exclusion of Nainital and Dehradun from the list of districts comprising hill region. This finding is contrary to the general notion that agriculture in U.P. hills is developed.
- (b) There is not much impact of modern technology on the productivity and the break through has not been achieved at all.
- (c) Increasing and strengthening of the resource base namely irrigation and promotion of application of HYV seed and fertilizer will accelerate the productivity level of paddy.

In view of the above, it would be most relevant first to lay emphasis on productivity enhancement of foodcrops. To think of cropping pattern changes in terms of subsistence crops to high valued crops or from agricultural development to horticulture or animal husbandry promotion would won't serve the purpose because it is the experience of most of the developed regions in the country that they first made break through in food production then could diversify their economies. Moreover, the hill areas, in particular, with very poor infrastructural facilities may not find comparative advantage except that in agriculture. Since farmers of hill districts are not much using new technology in crop cultivation, its use needs to be enhanced. In this context, it is essential to keep in mind that the package of new technology used in plain areas can not be totally accepted for application in hill areas because of topographical problems. Therefore, new package exclusively suitable to local conditions may be evolved. Thus, theentire programme of productivity improvement in U.P. hills is required to be framed and implemented according to local

conditions and needs.

#### Notes and References

- Note: Author is very grateful to Dr. G.P. Mishra, Professor, Giri Institute of Development Studies, Lucknow, for his guidance in writing of this paper. However, the author is alone responsible for all errors and analytical flaws if remain by chance.
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Table 1: Region-wise Cropping Intensity and Gross Value of Agricultural Produce (At Current Prices) in 1987-88.

Regions	Cropping Intensity	Gross Value of Agricultural Produce Rs. (at current prices)				
		Per Capita	Per ha. Gross Cropped Area	Per ha. of Net Sown Area		
Hill Region	164.27	1076	5455	8960		
₩estern Region	149.04	1254	6314	9411		
Central Region .	133.24	933	5314	7080		
Eastern Region	148.49	877	5024	7460		
Bundelkhand Region	111.05	1383	4135	4592		
Uttar Pradesh	142.56	1054	5488	7823		

Source: District-wise indicators of Development, State Planning Institute, U.P., 1990.

Table 1 (contd..): Regionwise Productivity Levels of Important Crops in 1988-89

•			(Qui	ntals/hect	are)
Regions	Paddy	Wheat	Oilseeds	Sugarcane	Potato
Hill Region	19.86	17.22	- 5.24	543.68	184.84
Western Region	22.82	26.69	9.30	531.85	202.08
Central Region	18.68	22.51	7.56	438,06	164.28
Eastern Region	15.21	20.56	4.95	443.45	165,18
Bundelkhand Region	9.73	13.23	4.79	383.58	183.98
Uttar Pradesh	17 <b>.</b> 52	22,54	7.72	502.60	183.98

Source: Uttar Pradesh Ke Krishi Aankre, Directorate of Agriculture, Government of Uttar Pradesh, 1988-89.

Table 2: Cropping Intensity and Gross Value of Agricultural Produce (st current price) in 1987-88

Regions	Cropping Intensity	Gross Value of Agricultural Produce, Rs. (at current prices)			
		Per Capita		Per ha. of Net Sown Area	
Almora	169.07	653	3098	5238	
Pithoragarh	180.43	1139	4635	8364	
Tehri Garhwal	162.61	619	2951	4798	
Uttarkashi	153.28	853	3906	5988	
Garhwal	152.40	519	2482	3782	
Chamoli	154.56	`556	3889	6010	
Hill Region (excluding Nainital & Dehradun)	161.05	723	3493	5697	
Western Region	149.04	1254	6314	9411	
Central Region	133.24	933	5314	7080	
Eastern Region	148.49	877	5024	7460	
Bundelkhand Region	111.05	1383	4135	4592	
Uttar Pradesh	142.56	1054	5488	7823-	

Source: District-wise Indicators of Development, State Planning Institute, U.P., 1990

Table 2 (contd...): Productivity Levels of Important Crops in 1988-89.

(Quintals/hectare)

District/Region	Paddy	Wheat	Oilseeds	Sugar- cane	Potato
Almora	10.82	9.65	6.58		183.78
Pithoragarh	11.39	12,90	6.28	502.60	183.98
Tehri Garhwal	13.19	11.02	4.24		183.98
Uttarkashi	12.83	13.08	4.27		183.98
Garhwal	10.69	11.09	4.93	502.60	183.98
Chamoli	12.16	10.62	4.94		183.98
Hill Region (excluding Nainital & Dehradun)	11.80	11.29	4.98	502.60	183.94
Western Region	22.82	26.69	9.30	531.85	202.08
Central Region	18,68	22,51	7.56	438,06	164.28
Eastern Region	15.21	20.56	4.95	443.45	165.18
Bundelkhand Region	9.73	13.23	4.79	383.58	183.98
Uttar Pradesh	17.52	22.54	. 7.72	502.60	183.98

Source: Uttar Pradesh Ke Krishi Aankre, Directorate of Agriculture, Government of Uttar Pradesh, 1988-89.

Table 3: Compound Growth Rates of Paddy Productivity: 1980-81 to 1990-91.

District/Regions C	ompound Growth Rates
The second secon	
Almora	1.83
Pithoragarh	1,87
Tehri Garhwal	-1,22
Uttarkashi	0.51
Garhwal	1,23
Chamoli	0.21
Hill Region (excluding Nainital & Dehradu	n) 0.90
Western Region	5.51
Central Region	<b>7.</b> 75
Eastern Region	5 <b>.</b> 86
Bundelkhand Region	6 <b>.</b> 56
Uttar Pradesh	5.13

Source: Computed from the productivity data of paddy, obtained from the Directorate of Agriculture, Government of Uttar Pradesh, Lucknow.

Table 5: Regression Estimates

			· · · · · · · · · · · · · · · · · · ·		And a section of continuous and the section of the		
+0.55+	Mo. of		ge Heg	Regression C	Coellicients	S	
UIS CLICE	obser- vation	Constant Se	Seed Family Labour	Hired Labour	Fertili- zer	Irriga- tion	R2
Almora	09	5,382	0.279%	•			0,1269**
Tehri Garhwal	. 09	6.638	- 0.285* (2.4879)				0.1438**
Combined	120	5.793	- 0.360* (2.1097)				0.1370**
Almora	09	3.620 0.0 (0.21	3.620 0.038 0.403* (0.2114)(1.834)	-9.115 (0.677)	0,063	0.2032***	9260.0
Tehri Garhwal	09	4.389 0.0 (0.28	4.389 0.040 0.419* (0.2893)(0.419)	(0.593)	0.058	0,2250***	9660.0
Combined	120	4.216 0.C	4.216 0.028 0.379* (0.2773)(1.845)	-0.114 (0.563)	0.596	0,1839***	0,0868
TAN THE STREET, AND THE THE THE THE THE TREET STREET STREET STREET STREET	Committee of many siles to be a self-to-self-t	A CONTRACTOR OF THE CONTRACTOR	To brown of the country of the count	AND AND THE PARTY OF THE PARTY	THE PERSON NAMED IN COMPANY OF THE PERSON NAMED IN CO.	TO SECURE THE SECURE OF THE SE	en der den den sen se den sen sen den sen se

\* Significant at one per cent level; \*\* Significant at five per cent level; \*\*\*Significant at ten per cent level.

Note: Figures in brackets are the standard errors.

Role of Horticulture Vis-a-Vis Agriculture in the Development of Western Himalayan Agro-Climatic Region

\* G.S.Mehta

# Introduction

Despite the rapid strides made in agriculture production during the planning exercise of last forty years, inter-regional, inter-sectoral and inter-class disparities in the agricultural development are still existing. This is basically due to the lack of proper planning approach and the lack of required attention in the need of specific location and region of the country. Therefore, the Planning Commission felt it desirable to formulate a development strategy based on the profile of the region specific in terms of the availability pattern and use of various natural resources and the potentials and prospects of various regions.

This planning strategy provided by delineating the country into fifteen broad agro-climatic zones based on the characteristics of soil, topography, climate, rainfall and water availability. The approach of the Agro-climatic Regional Planning lies in assessing regional potentials and problems and thus envolving development strategies and programmes suited to the local resource endowments and needs of the farmers. The approach also focus on the aspects related to the development programme of agriculture for area specific and follow regional development strategy. The

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major objective of the planning exercise for Agro-Climatic Zones is also to gemerate, within a regional framework, a plan for creating additional employment opportunities particularly for the benifits of land less labourers and marginal farmers.

In this planning exercise of the Agro-Climatic Zone, the two hilly states, Jammu and Kashmir and Himanchal Pradesh and a hill region of Uttar Pradesh, are included in the Western Himalayan Region. In the identified himalayan zone, situated on the northern part of the country, the agricultural activity is a main source of livelihood of a majority of the population. And the pressure of population is unprecedently increasing on it. However, even after initiating several measures towards agricultural development under the planned development strategies during past the agricultural productivity has not been increasing satisfactorily due to the nature of terrain and steep slopy small land holdings. The horticulture industry also occupies an important position in the farming system of the himalayan zone. The region has different climatic zones suitable for growing temperate, sub-tropical and tropical fruits. Temperate fruits like apple, pear, peach, plum, apricat, cherry, walnut, hazelnut etc. are grown at elevetion of 1000 to 3000 metres above sea levels. In areas extending from 300 to 1400 metres sub-tropical fruits viz. citrus, mango, litchi, locat, guava, banana, papaya, strawberry etc. are grown successfully. However, the farmers in the region are mainly putting their available land area

under the cultivation of field crops for several gen ations while the cultivation of agricultural crops in the relation of agricultural crops in t

### The Study

In this light the present paper beside examining the potentials and feasibilities of horticulture development, examines the differences existing in the level of productivity, returns and employment obserption capacity between agriculture and the horticulture sector in Himanchal Pradesh and the hill region of Uttar Pradesh of Himalayan Agro-Climatic Zone. Since the cultivation of apple is mainly carried out in the region therefore the main focus of the study is on the cultivation of apple. The paper is an outcome of the study carried out by the Giri Institute of Development Studies in collaboration with Development Research Institute Tilburg, The Netherlands. For the study a sample of 501 fruit growers consisting of 251 growers in H.P. and 250 growers in U.P. hills was selected from the areas which are famous for growing fruits particularly apples. The sample of growers was selected proportionately from different orchard sizes.

# Characteristics and Potentials of Horticultural Development in the Sample Areas

The state Himanchal Pradesh is situated in the North West Himalayan Region touching Uttar Pradesh in the East, Jammu and Kashmir in north, Tibat and China in the North East and Punjab and Haryana in the south. The state has a geographical area of about 56 thousand sqr. kms. It has

twelve districts and a population of 42.81 lakhs living in 16807 villages and score of towns. The physiography of the state consists of mountainous tract with elevations ranging from 350 metres to 6975 metres above sea level. The climate varies from hot to sever cold depending upon elevation. The state has the highest and lowest average rainfall varing from 18cms to 300 cms. and average rainfall accounts 150 cms. Agriculture is the mainstay of around 76 percent of the rural population. The land under cultivation is 6.26 lakh hectares out of which 20 percent is under horticulture. Average size of holdings is 1.62 hestares. The fruit industry is an important source of household incomes for majority of the agriculturally dominating population of the state. Among the important fruits grown in the state, apple is an important dominating commercial fruit which is grown in the area who se altitude is 1500 metres or more above sea leval. In these areas soils are quite deep and fine lectured varying from silt loan to clay loan and are of light to dark brown colour with good reserve of humus and limited quality of minerals and plant food, the soil is thus very productive. The plantation of fruits particularly apple is going to be quite popular is H.P. as the area under apple plantation has been increasing tremendously. The total area under fruits which was 792 hectares during 1950-51 has increased to 1.35 lakh hectares during 1986-87. Of the total area under fruits during 1986-87, sizeably a highest proportion of area amongst all fruits is under the cultivation of apple (69.26 percent) followed by citrus (22.22 percent) and under

temperate fruits (18.52 percent). The productivity of apple is estimated to be around 6.8 tonnes per hectare in the state.

On the other, the U.P. hills comprising eight districts, situated on the northern part of the state Uttar Pradesh lies in the central Himalayas. The elevation of hills extends from approximately 300 metres to 7000 metres above sea level and the temperature ranges from 16°c to 40°c, but normally it goes upto freezing point even -5°c during winter. The geographical area of the entire hills is 51.25 thousand sqr. kms. Out of which 841.97 thousand hectares is under cultivation. And the fruits are grown over 148 thousand hectares. There has been an increase of 23.21 percent and 55.65 percent in the production and the area of fruits between 1980-81 to 1986-87 in the region. The main fruits grown in this area are apple, appricot, plum, peach etc. while apple is the main fruit crop which is cultivated in an area of 49 thousand hectares. The population of the region as per 1991 census is 5.87 million which is 4.23 percent population of the state. As per 1981 census, the main occupation of the 70.6 percent workers in the region is agriculture and 92 percent of the population is depending on agriculture for their livelihood. However the cultivated land in the region constitutes only 12.52 percent and a large part of its is under forest (63.77) percent). The land holdings are also very small. Average size of land holdings constitute to be 0.99 hectares and 84 percent respectively. And 60 percent of the operational land holdings in the region are less than one

hectares and 94 percent are less than three hectares. Besides, the nature of terrian, scattered marginal and steep slopy land holdings have not been providing well in increasing agriculture productivity.

The horticulture industry, therefore occupaies an important position in the farming system and thus for providing gainful employment opportunities and increasing the income of the masses in the hilly region. Beside this, the development of tree plantation provide permanent green cover to the soil. Further fruits in way have a special significance as compared to field crops since they provide a higher source of nutritive diet value to consumers and relatively higher value which boost the returns, provide better stability through multi-product range and offer a better opportunity for value adding than field crops to the farmers. Moreover, the cultivation of fruits is purely labour intensive and requires significantly high labour force starting from the stages of tree plantation to the point of its marketing. Being a labour intensive enterprise it is well suited to a area like Himalayan Agro-Climatic Region. which have abundance of manpower and a relatively scarcity of capital resources. At the same time production of fruits can be helpful in earning foreign exchange through proper exports of fresh as well as processed fruits.

# Basic Requirements for Plantation of Apples

As indicated earlier that among the various fruits cultivated in H.P. and hill region of Uttar Pradesh, the apple is a main fruit crop which is grown on a much larger proportion of the total fruit grown area. Our focus of study is, therefore, devoted in the cultivation of apple in the sample states. The plantation of apple can be carried out in the temperate hilly areas with lower temperature. In the winter apple trees require temperatures below 7°c (45°f). Most apple varieties need such temperatures for about 200 hours in order to achieve complete and adequate rest, though some varieties can manage with as little as 200 hrs. of chilling. During summer, apple trees require around 20% to 30°c (58-86°f) temperature. Apple can be grown in a wide range of rainfall from evenly spread rains of 25 to 37 mm. (10-15") per year to heavy seasonal rains upto 125 to 175 cm (50-70") as during monsoon. Besides, certain minimum soil moisture is necessary for the proper growth of the apple trees and the development of fruits. Thus looking at the geographical, availability of soil, climate and other basic favourable conditions needed for the plantation and development of apple it seems that both H.P. as well as hill region of U.P. are most suitable for growing the apple in the available land area so as to create the additional employment opportunities and increase the income levels of the population.

However, the development of apple cultivation has been at much higher order in Himanchal Pradesh as compared in U.P. hills because the cultivation of apple in former state has started much earlier than in the later one. The productivity of apple per hectare is estimated around 3.4 tonnes in U.P. hills which is around half of the productively rate of apple in H.P. However if we consider the increase in area and production of apple in H.P. and U.P. hills between 1970-71 and 1985-86, the area under apple plantation and production of apple has increased at much higher rate in U.P. hills as compared to H.P. The area under apple has increased 72.26 percent in H.P. and 148.26 percent in U.P. hills and also the production of apples has increased by 130.26 percent in H.P. and more than three folds in U.P. during 1985-86 over the period 1970-71.

# Productivity Levels in Apple Growing

Productivity of apple trees is to be examined across their different age groups of the plantation. The differentials in productivity at similer age groups of trees are expected to be determined by the differentials in geographical and climatic conditions of the areas, varieties of apple trees grown, utilisation pattern of various infrastructural facilities for the growth and development of the apple trees. However, the quantum of production per tree is expected to increase simultaneously with the growth and the development of trees although it starts decreasing after reaching at a certain age of trees. Our analysis reveals that the average production per tree works out to be around 61 kgs. and the peak production per tree touches

around 86 kgs between the age group of 31 to 50 years. It has also been noticed that the production per tree is systematically increasing according to the increase of age of the apple trees however, after reaching at peak productive stage of the trees the productively is found to be decreasing to a certain extent. The state level analysis reveals that the productivity of apple trees at their different age groups is around three folds higher in H.P. and compared to U.P., however the apple trees that are starting bearing fruits at their earlier ages of 5 years are found in case of U.P. only. The average production per tree is estimated to be 87 kg. for H.P. as against of 23 kg for U.P. The highest differentials in productivity rates of apple trees are in favour of H.P. and are due to the facts that in H.P.

Table I
Productivity of Apple Trees by their Age Groups.(in kg)

Age Group	Himanchal	Pradesh	Uttar	Pradesh	All Sta	tes
of Trees (years)	Production	Produ- ction per Tre	ction	Produ- ction per tre		Produ- ction per tree
upto -5			6000	0.41	6000	0.31
6 –10	14570	8.77	10900	1.30	24970	2.59
11 -20	1478124	92.05	1193480	34.11	2671604	52.54
21 –30	2701194	97+61	490953	31.41	3192147	73.72
<b>31 –</b> 50	1214583	96.43	74548	31.61	1289131	86.21
above 50'	77775	94.27	6000	29•27	83775	81 <b>.</b> 33
All Age Groups	5186246	86.84	1 <b>7</b> 81381	23.45	7267627	52.24
Average production of tree						
below 5 years		93.28		29.02	-	60.52

Varieties of apple trees planted are higher productive and the commercialisation of apple begun quite earlier in H.P. than in U.P. which have influenced the grower to use the scientific methods of cultivation of apple trees, proper and sufficient use of various inputs like chemicals, fertilizers and pesticides in case of former than the later state.

# Level of Productivity Costs and Returns

Estimating the per unit value of production, costs and returns the analysis shows that the cultivation of apple is comparatively much more profitable than the cultivation of field crops. The apple crop is found providing 53 percent higher amount of returns than the field crops and the productivity per acre of land is also found to be over five times higher in the case of the cultivation of apple than the agricultural crops. However, the returns per acre of land in the cultivation of apple are cound significantly much higher in the case of Uttar Pradesh. And the returns in the cultivation of apple as compared to the agricultural crops are found to be 53.20 per cent for U.P. as against nine times higher for H.P. It has also been observed that the higher amount of returns in case of apple cultivation are the result of higher amount of per unit investment carried out by farmers on its cultivation than on the agricultural crops. As the per acre cost of production in apple growing is turned out to be three folds and over ten folds higher than the cost of cultivation of agricultural crops in U.P. and H.P. respectively. Further we observed that the benifit of growing apple is of a higher order for the farmers with smaller size of orchards than with relatively larger size of orchards.

Table - 2 (a)

Acre Value of Production, Costs and Returns

Per Acre Value of Production, Costs and Returns (Himanchal Pradesh and Uttar Pradesh Combined)

Size of	Production		Costs	R	eturns
Orchard No.of trees	Agri- Apple culture	Agri- cultu		Agri- Cultur	Apple
Below 75	3175 17475 <b>(</b> 450•39 <b>)</b>	2905	13767 (373•91)	270	3708 (1273•33 <b>)</b>
75-100	2703 295 <b>25</b> (994•56)	1341	108 <b>37</b> (708.13)	1362	18749 (1276.58)
100-150	4096 18448 (350•39)	2251	7758 (244.65)	1837	10690 (481.93)
150-200	4784 308 <b>51</b> (544.88)	1779	12297 (591.23)	3005	18554 (517•44)
200-300	5116 33064 (546,29)	2145	12604 (487.60)	2971	20460 (588.66)
300-400	5053 29776 (489•27)	705	18369 (2505•53)	4348	11407 (162•35)
400-600	6553 29406 (384•74)	1217	12252 (906.73)	5336	17154 (221.48)
600 and above	4964 26060 (424•98)	834	9280 (1004.08)	4130	16780 (306•30)
All Groups	4664 28036 (501.12)	1641	12071 (635.59)	3026	15965 (427•59)

Note: Figures in brackets indicate the differences in Productivity, Costs and returns between the cultivation of agricultural crops and apple.

Table - 2 (b)

Per Acre Value of Production, Costs and Returns from Agricultural Crops and Apples in Himanchal Pradesh

Size of	Produ	ction	Cos	sts	Re	turns
Orchard (No.of trees)	Agri- culture		Agri- culture		Agri- cultur	
Below 75	7120	50743 (612.68)	2656	45954 (1630•20)	4464	6289 (40.88)
75 <b>–</b> 1c● <sup>†</sup>	3128	40120 (1182.60)	2142	14168 (561.43)	986	20052 (1933.67)
100–150	2826	35113 (1142.50)	2451	13816 (463.69)	375	21297 (5579•20)
150-200	3825 .	43014 (1024•55)	2384	15682 (557•80)	1441	27332 (1796.74)
200–300	<sup>-</sup> 3018	41628 (1279•32)	1876	15355 (718.50)	1142	26273 (2200.61)
300-400	29 <b>37</b>	39267 (1236•98)	269	24951 (9175 <b>.4</b> 7)	2668	14316 (436•58)
400-600	3818	40593 (963.20)	2547	13662 (436,40)	3271	26931 (723.33)
600 and above	6356	45594 (617•34)	1498	15769 (952•67)	4858	29825 (513.94)
All Groups	3937	41596 (956•54)		17091 (1035•62)	2432	24505 (907.61)

Note: Figures in brackets indicate the percentage differences in the productivity and returns between the cultivation of agricultural crops and apples.

Table - 2 (c)

Per Acre Value of Production, Costs and Returns from Agricultural Crops and Apple in Uttar Pradesh.

Size of Orchard	Produ	ction	C	osts	Returns	
No. of trees	Agri- culture	Apple	Agri- oultur	Apple e	Agri- culture	Apple
Below 75	2263	6126 (170.70)	2963	2786 (-6•35)	-700	3340
75 - 100	2516	7664 (204.61)	988	3904 (295.14)	1528	3760 (146.07)
100 - 150	4453	6205 (39•34)	2205	3307 (49•98)	2248	2898 (28•91)
150 - 200	5104	11368 (122.73)	1577	6876 (336.02)	3527	(27.36)
200 - 300	6039	13561 (124.56)	2264	6338 (179•95)	3775	7223 (91.34)
300 - 400	5942	12998 (118.75)	888	6809 (666.78)	5054	6189 (22.45)
400 - 600	9214	13090 (42.07)	2868	6195 (116.00)	6346	6895 (8.65)
600 and above	4522	10253 (124.44)	623	4028 (546.55)	3899	6225 (59.66)
All Groups	4961	10644 (114.55)		5642 (232.66)	3265	5002 (53•20)

Note: Figures in brackets indicate the percentage differences in production, costs and return between the cultivation of Apples and Agricultural Crops.

Per Acre Mandays Employment in the Cultivation of Agricultural Crops and Apple in H.P. and U.P.hills.

BERNAUDE LANCE FRANCE CONTRACTOR FOR A POPULAR	en ann 14 e estado 140 antes estados masses estados 140.º	agen mengagan mesaman sulah tah sulah sulah sulah	men washin de sansa W.	tan a mandra mandra service e esta proceduração	and the state of the same of t	career's recursion treatments recursions recommended
Size of Orchard	Himanchal	. Pradesh	Utta	ar Pradesh	All St	ates
(No. of trees)	Agri- culture	Apple	Agri- cultur	Apple e,	Agri- eultur	Apple e
Below 75	568	1516 (166.90)	358	446 (24.58)	397	718 (80.85)
75 – 100	363	643 (77•13)	137	436 (218•24)	207	575 (177•77)
100 - 150	286	509 (77•97)	204	340 (66.66)	222	412 (85•58)
150 - 200	274	473 (72.62)	140	500 (257•14)	173	484 (64•25)
200 <b>-</b> 300	212	380 (79.24)	241	362 (33.42)	232	373 (60.77)
300 - 400	68	371 (445•58)	. 64	325 (407•81)	65	354 (444•61)
400 - 600	51	260 (409•80)	206	262 (27.18)	129	262 (103.10)
600 and above	177	218 (23•16)	48	178 (270•83)	79	195 (146.83)
All Groups	207	386 (86.47)	174	307 (76•43)	184	351 (90•76)

Note: Figures in brackets indicate the percentage differences between employment in the cultivation of agricultural crops and apple.

Thus on the basis of these observations it will be proper to conclude that for providing more employment opportunities and increasing the levels of incomes of small farmers in the Himalayan Agro-Climatic Region the plantation of apple trees on their farms would be of the appropriate policy.

# Level of Employment Absorption

The manpower requirement in the cultivation and marketing of apple as well as field crops is met by employing paid workers as well as own family members. But carrying out the production and marketing of apple require significantly higher number of mandays employment as compared to agricultural crops. Our analysis reveals that on an average per acre land mandays requirement for carrying out production and marketing are reported to be 351; of which 66.67 percent of the mandays are met by employing unpaid workers followed by 26.78 percent by paid casual workers and 6.55 percent paid reguler workers. Further it is observed that the cultivation of apple is employing around 91 percent higher mandays employment, consisting of 86 percent in H.P. and 76 percent in U.P., as compared to the cultivation of agricultural crops in the farms.

Further the growth in mandays employment in the production and marketing of apple has been calculated between the period of 1981 and 1986. The overall increase in mandays employment is registered to be around 40 percent consisting of 43 percent in H.P. and 35 percent in U.P. The highest increase in mandays employment is found in case of paid regular workers (100 percent), followed by casual (67 percent) and unpaid family

workers (28 percent). The highest increase in mandays employment for paid workers is registered in the orchard size group of 401 to 400 trees and lowest in the highest size group (63 percent). Further in both the states the percentage increase in mandays employment for paid workers is also found significantly higher than the unpaid family workers. Thus growing apple is seen as an important activity which is providing employment opportunities, not only to the family workers of the growers but also to a sizeable proportion of the outside family workers as well. It has also been noticed that the supply of the workers from the growers families have been utilised at a optimal level and the further requirements of workers is fulfilled by hiring paid workers. This is evident from the fact that there has been a much higher increase in the mandays employment of paid workers as compared to unpaid workers between the years 1981 and 1986.

#### Conclusion

Since the agriculture activity in the himalayan agroclimatic region has been well recognised to be un-economic. This is on account of undulating topography rugged terrain, steep slopy small holdings and several other unfavourable geographical conditions. Thus the typical topography and agroclimatic conditions in the region limit the scope for production of field crops, but offer much suitable conditions for horticulture crops. The region has different climatic zones suitable for growing temperate, sub-tropical and tropical fruits, perticularly for growing apple trees. Our analysis has well

depicted that available land in himalayan agro-climatic region has experienced to be economically more suitable for the cultivation of horticulture crops particularly apple crop as compared to agricultural crops. As the level of per acre productivity as well as returns to the cultivation from the plantation of apples are significantly much higher than from the cultivation of agricultural crops. Also the cultivation of apple on per acre of land is providing comparatively larger/volume of employment opportunities to the local people than the cultivation of agricultural crops. Significant level of increase in the labour absorption in the cultivation of apples over the years has also been witnessed the importance of horticulture development for area development. Therefore, fruit plantation taken up on a systematic and organised manner could be used as an effective instrument for providing the opportunity of gainful employment and to raise the income levels of the people. This programme could, therefore, prove useful in the himalayan agroclimatic region to mitigate the problem of existing poverty of the rural masses.

The marketing of horticulture crops in the region has been observed a major problems which is restricting the growers to convert their available land area from the

cultivation of agricultural crops to horticulture crops. The growers, particularly small growers, are generally selling their produce on a pre-harvest contract basis so as to minimise risks. As a result, they are receiving much lower prices than the prices fetched while selling it directly in the market. The Government could, therefore, take up some steps in order to mitigate this disadvantage so that the farmers which are not cultivating horticulture crops may also be influenced to convert a sizeable land area from the cultivation of agricultural crops to the horticulture crops.

# THE MEST FOR AUTOLOLIMATIC ZONAL PLANSING - A CASE STUDY OF SIXKIN.

K.J. Cheah\*

The need for planning for agricultural development based on scientific stilisation of svailable resources both natorial and man-made in a sub-regional context has received greater ettention in the recent period. Accordingly, the ocuntry has been divided into 15 agro-climatic somes after taking into consideration of the agro-climatic factors, like, topography, climate, soil type, water resources etc.and other parameters, such as, land use, agricultural system, agricultural production, social and demographic structure, etc.

The State of Sikkin fells within the Basters Rualeyen Zone which is consistation with adverse physiographic corditions and socio-dultural complexes. The peculiar topography. difficult terrains, sestioned population, in-approachable farflung villages, all pose a challenge before the planners where the norms of development as suited to the plains could not be applied. The various programes, hitherto undertaken for the development of Bikkin were by and large piecewel in nature and a comprehensive approach to hill area devalopment was hardly gradertaken, An result, there had been neither spatial dispersion of autivities nor any substantial increase in the commonio prosperity of the State. The State continues to reasin poor and underdeveloped. This probably is one of reasons for a growing dissention emong the people of the bill areas for a larger share of national investment for the upliftment of their scoloecomonic condition.

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Reapting this is view attempts have been made in this paper to lightly the constraints to development and suggest policy measures to grantome them within the given resources in this Etets.

This paper is based on secondary sources data collected by the agro-Roomomic Research Central Fiers-Marati.

Sikkim which became the 22nd state of India in 1975, lies in the Eastern Mimalayan Range between 27°5° and 28°9° north latitude and 60°56° longitude. It has an erea of 7096 aq.ks. Being a part of inner ranges of mountains of the Mimalayan, Sikkim is wholly a hilly state having varied elevation ranging from 300 to 3400 metres. Owing to the great diversity in shape, elevation, slope, etc., the variation in elimate and vegetations are also very high. The mean approal rainfall varies from 2000 mm to 5000 mm with intensity ranging from driving shower to becreatial rains.

The land such lable for cultivation is considerably low in 350kin which is the total reporting area of mountsins and forests. If the total reporting area of 7.10.000 heaters, only it per cent is under cultivation, as compared to more than 65 per cent in the country as a whole. The area under forests is perceptibly higher in this state, although them had been a great deal of infringement of forest land for cultivation almost throughout Sikkin during the recent past. The area under forests forms word than 36 pear cent of the total reporting area in this state as compared to 22 per cent in the country.

The distribution of operational holdings (as per 1990-61 Agril, census) in Silvin is highly inequipions. The marginal and small holders taken together constitute of per cent of total holdings but cultivate only 28 per 5000 of the total land area in the state. While the holdings above 4 hectares form 12.5 per cent but control sore than 44 per cent of the total spersted land. The sverage size of holdings in the state is 1.95 hectares. Ownership cultivation is the predominant form of land management in the state which forms 95 per cent of total operated land and the rest under different forms of tenancy.

condition. The only source of irrigated in this state is spring waters which is, however, evaluable during the monsoon period. The supply of water from this source suffers from the basic defect that these are not supported by reservoirs and therefore flow of water for irrigation is restricted to kharif season only. Irrigation is mostly confined to rice fields where well defined channels exist. City 34 per cent of total holdings in the state has the benefit of irrigation and only 14 per cent of the net sown area is irrigated.

grein crops. However, its importance in this state in little less than the same in the country. The error under foodgrein crops accounts for 62 per cent as compared to 72 per cent in the country (in 1984-85). Among these cropps make is most important, forming 29 per cent of the Country cropped area. This is followed by rice (136), wheat (65) and

pulses (7%). Other foodgrain crops are regi and barley.

Among the non-foodgrain crops, cordamn and oilseeds are

most important crops, forming 18 per cent and 9 per cent

of the total cropped area respectively. Others are potato,

poynizin and fruits, accounting for 3 per cent each of the

total cropped area in the state. The intensity of cropping

is, however, very low, only about 7 per cent of the net

nown eres is cropped more than once.

Maragal high-yielding varieties of rice, wheat and mains have been identified for adoption in this state. Miguificent progress has also been made in this regard. Moont 61 per cent of the total rice eres and 51 per cent of withe have been brought under high-yielding seeds. The entire who under wheat is cultivated with these seeds. the war of themical fertilisers, pesticides and manures is very low in this state. The per hectare consumption of chemical fertilisers (N+P+K) is only 10.84 kg. as compared to 50 kg. in the country. Between 1982-83 and 1986-87 it had increased by about 25 per cent in Sikkim as against more than 42 per cent at the national level. The use of pesticides in outle insignificant among the farmers in this state. The state is very beckward in respect of the use of tools and implements. The ferming operations are corried out with traditional tools and implements which are locally evailable.

The yield level of all careal crops is much lower in Bilkin then the country as a whole. The per bectere yield pates of rice, wheat and maise, the main crops in this state (in 1985-86) are 1038 kg. 1604 kg., and 1209 kg. respectively. The country are 1552 kg. 2046

kg. and 1441 kg. However, in respect of the high-velued crops, such as pulses, oilseeds, cardenous, soyebin and dry ginger this state records a much higher yield rate than the country. These crops also occupy an important position in the crop-structure of this state.

The cultivation of plantation and harticultural crops occupy an important place in the farm economy of sixtim. Ten plantation covers an area of 200 hectares. Carafmon, another plantation crop covers as area of 15,000 hectares, forming about 14 per cent of the total acreege in the country (in 1982-83), The production of this grop is about 4,000 tonnes which constitute more than 44 per cent of the country's production. The average yield of this crop is nearly 3 times higher than the same in the country.

The state has an erec of 11,489 heckares under horticultural crops which form about 15 per cent of the net cultivated area. These crops are apple, orange, quave, limen, etc.

The state is encowed with rich forests, Nove then
The per cent of the reporting area of the state is under
different kinds of brests. The forests are mostly Government owned. Of the total forest area, 46 per cent is merchantable, 34 per cent pasture, 2 per cent under park and rest
unprofitable. The forest products consist of timber, round
wood, firewood, characal, medicinal harbs, etc.

Livestock is an integral part of life and economy of the people of Sikkim. It is reared in almost all the rural households for milk, meat and wool production and also for draft power and manure. During the period between 1976 and 1982, the number of each kind of livestock, except sheep had significantly increased. The number of cattle increased by nearby 56 per cent and this is followed by goats (57.5%) and pigs (45%). In the case of sheep population, the number declined by marely 17 per cent.

Rearing of poultry birds is also widely prevalent emong the rural people of Sikkim. Its number also shows an increase by 81 per cent between 1976 and 1982.

The entire area of Sikkim has been declared as non-industrial area. However, village and cottage industries and small scale industries, with traditional technology abound in the state. These enterprises provide employment to more than 30,000 persons.

Sikkim had a total population of 3,16,385 in 1981. The density was estimated at 45 persons per sq. km., as against 216 in the country. The low density of population in this state is attributable to the topography of the mountains, with deep slopes thereby restricting the area available for human habitation.

Tevel of unbenization is very low. Only 15 per cent of the state's population live in unban areas as compared [1980].

Literate with a marked variation between males (43.5 per cent) and females (21.5 per cent).

A significant demographic feature of this hill region is its high work participation rate. It is significantly higher among the females. Sikkim recorded a participation rate of more than 52 per cent among the males and 35 per cent among the females in 1981.

state. A little over 62 per cent of total workers resorted to these occupations in 1981. However, the proportion of workers employed as agricultural labourers was only 3.4 per cent as against 25 per cent in the country. Among the non-agricultural occupations, construction, trade and commerce, transport and communication and other services accounted for major share.

This state lacks in basic infrastructure services and emenities, such as roads, power, medical, banking and educational facilities. Motorable roads are the only means of communication and transportation of goods in the state, but still about 57 percent of the villages are lying beyond 2 kms. from motorable roads. Only 57.7 per cent (in 1987) of the villages is electrified. Similar is the case with medical, banking and educational facilities.

In the light of the above discussion the following areas of development in this state have been identified and policy measures for them suggested.

One of the problems of agricultural production in this state is that the available land resource is subjected to heavy soil erosion and degradation due to its peculiar topography.

Nearby 50 per cent of the cultivable area of the state is effected with these heserds. Measures should therefore be taken to arrest soil erosion by well terraced bunded fields and

vegetation including planting of trees.

Sikkin falls in a high reinfall area, but due to high elevations, earface run-off of veter during the rainy senson is high. The rivers flow through quries making it difficult for use of the flow water. Thus this development of appropriate valor harvesting technology is essential for utilizing the surface water resources both reinfall and flow. Water sources should be tapped at higher elevation before it is allowed to flow down.

The eveilebility of irrication water itself will lead to improvement on terreces and levelling of fields by the farmers with a view to using the limited supply of water more efficiently. This has been the case for rice cultivation in this state. Therefore, whenever possible irrigational facilities should be provided so that the complementary relationship between irrigation and improved terraces could be used for increasing the production of crops. Consolidation of scattered land holdings can also be taken up which will help the farmers to adopt improved soil and mater conservation practices und improved crop technology.

Agriculture is just a means of subsistence to whost 65 per cent of the total population in this state. The actual sown area is only 11 per cent of the total land area and only 15 per cent of it is under irrigation. The crop structure is predominated by openal crops. The use of circulturation which is covered with irrigation. Especial collination which is covered with irrigation. Especial tools and implements are not used at all. Although a very high proposition of the eras under cereal crops is covered with

high-yielding needs, the productivity of these crops is much lower than the same in the country. However, the productivity of these crops can be increased through the adoption of improved and appropriate crop technology. High-yielding seeds of crops suitable for lands of different attitudes and velleys, mid and high hills and fit in rotations with other crops should be introduced. The supply of such seeds and other complementary inputs should be ensured to the farmers in time and in adequate quantities.

soyabin, ginger, pulses and cileseds which are not only grown on an extensive scale in this state but also have: higher yield rates than the country. Measures should therefore be taken to extend the area under these craps even by replacing the low productivity craps, such as, ragionalize, wheat and even rice. The agro-climatic condition in this state is suitable for growing these high-valued crops, particularly cardinom, bilaneds, girger and soyabin. Sinkin also enjoys a sessmal advantage in cultivation of vegetables. These can be grown in the rainy sesson which starts much earlier and lasts longer in this state than the states in the plains. Thus there will be a lot of depand for these vegetables in the plans and the growers will get good prices

This state being endowed with diverse widnets owing to varying elevations offers ideal agro-climatic cituotion for cultivation of a wids variety of tropical and temperate fruits in the hills and welleys. The state is already having some areas under fruits such as oranges, applies, gusys, lemon, etc. However, due to lack of knowledge about scient

this sub-sector remains isolated from the impact of him technology. Moreover, for this enterprise to devolop and prosper, marketing and other intrastructural facilities have to be provided. The processing units and storage facilities which have not used much beadury have to be strong-thered.

Livestock rearing is amother premishing area where there is transaction occur for development in Sikim through denotic ingrovement of breeds, feed supply and bealth water we negeneat. The state is endowed with forest wealth and rich fooder resources. It has a vast area under posture and grazing land which can further be devaloped by schoolding menegement for greaten of catele. The climate is also conductive to livestock rateins. This state is particularly swited for reising spets and sheep on a large swale due to the high pleverior and explosi phisianrephy. In the cape of sheep rearing it has been observed that the produce tdeaty in terms of weal production is higher in this erace then the come in the courtry. It simuld, however, be integrated with marketing, spinning and wasving which . will forther intresse employment and income to the rural people. Other promishing activities in this state are ply and poultry farming which could substantially increase employment and income to the people. Milorta should therefore be made for the devalopment and encourage. merk of animal husbandry and spultry forming which have comparative siventage in this state.

A typical feature of land use in this state is that more than 36 per cent of the land eres is under

foreste, 10 per cent under pasture and grantes lands, and about 3 per cent under culturable waste. Thus about 50 per cent of the land once in the state is emenable to government policy manipulation. Therefore, there is ergent ased for formulating and leunching an appropriate format development programme which will not only increase revenue from lorestry to the Jovernment but else provide employment to the people of this store.

scale industries are limited in this state, there is considerable scope for development of ages and forest based
small neels industries. The important among them are, saw
mill, wedges furniture making units, milk, fruit and vegetable prodesing units, rope and basket making and pharmscacutical units, etc., which can take advantage of the climatfe and dust and pollution free atmosphere and bill location of this state.

ttered population and in-upproschable farilized villages

pose as constraints to the development in this state. Roads

are the only messes of transport and communication. But most

of the villages are still unconnected with metalled roads.

Thus for the development of transport and communication,

priority should be given to the construction of new roads

and improvement of the existing and.

Eikkin is gifted with places of seemid beauty, sometein peak, bush velleys and flowing rivers. Effects should therefore be made to develop tourism by making evallable of macesary infrastructure to the courists coming from the

nontry as well so from stance. This will help to constrate many activities which will recrude employment and income to the people of this state.

sixtin has a high rate of participation among female population who are mostly engaged in farming activities and livestock resting. It is thus essential that the female workers should be imperted recessary training and stacktion for new auterprises. Image mass should also be taken to improve their nutritional status call overall health.

programmes and a greater condination among the various inplementing agencies have to be ensured. The success of all
the programmes ultimately hinges upon the development of
evercees and consciousness among the resal cases. Ifforts
should therefore be taken to ensure their effective perticipation in decision making and execution of the developmental
programmes.